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MR. PRESIDENT, FELLOWS OF THE ROYAL COLLEGE OF SURGEONS, LADIES, AND GENTLEMEN,—I beg to thank you for the honour you have done me in appointing me to deliver this Arris and Gale lecture. I feel that the best mode of expressing my gratitude will be to proceed without more ado to the subject which I desire to lay before you.

If we endeavour to penetrate to the actual foundations—the very bedrock—of disease we shall find that our ultimate conception of its causes can be broadly summarised in two words—exhaustion and injury. Amœbæ may, it is said, be immortal, but it is impossible to conceive of a complex living being which will not eventually break up, die as we call it, as the result of wear and tear. Very few human beings, indeed, come to this end; the battle of life entails wounds and scars, injuries by external and internal noxæ, chemical, physical, and biological, gross and microscopic, any of which, alone or in combination, may contract the vital span. Nor are the two great causes of disease invariably dissociated in their action. There is always the possibility of a *circulus vitiosus;* the injured organ is the sooner exhausted, while noxæ—such as bacteria—find an easy prey in a body brought down by wear and tear. We must at the same time remember that disease processes are not, strictly speaking, new processes. They are simply the normal—or as they are often called physiological—activities of the body perverted by the incidence of the factors which I have just outlined. It follows that a knowledge of physiology is essential to the proper understanding of disease; that the converse is not strictly true, that the findings of experiment are not always directly transferable to clinical medicine, I shall have to point out before the end of this lecture.

One more consideration—derived from biology—must be taken into account in framing our conceptions of disease. Just as there has been a struggle for existence among living beings, so the individual tissues have fought with one another for the mastery. And in both cases the victory has been gained at the cost of greater delicacy, greater vulnerability. The nobler tissues, the elements of the nervous system, of the heart muscle, of great and complex glands like the liver, require a finer pabulum than the plebeian cells—such as those of connective tissue—which surround them. A deterioration in the quality of the pabulum, such as the circulation of a poison—e.g., alcohol or the syphilitic virus—in the blood, will tell first on the former. The parenchymatous elements will weaken, will eventually die, and the connective tissue, which can still thrive on the inferior pabulum, will, like a weed, choke and ultimately replace them. This is, in brief, the story of cirrhosis of the liver and of many of the system-degenerations of the central nervous system.

To-day I propose to discuss what I may call the permanent defences of the organism, defences which are always ready for action and are constantly coming into effect throughout life. They are to be distinguished from those which are only developed in circumstances of special need; these, with which we are not now occupied, may be considered under the general term immunity. Now it is perfectly easy to realise that were it not for some mechanism or series of mechanisms within the body we should be poisoned every day of our lives or would die speedily from some infectious disease. How the former of these contingencies is averted is the problem with which we are at present concerned, and I think that its solution lends itself to explicit demonstration. I shall divide these mechanisms into three chief classes, depending upon their evolution in succession to meet the needs entailed by increasing organic complexity.

In the first place there is what I have named the physiological reserve or the power which each organ, each tissue, and no doubt each cell, has of calling up its own latent energy in its defence. Secondly, there is the biochemical interrelation of organs, by which one of them can, by chemical means, evoke in another changes which act in its defence. The third, the latest and most complex development, is the nervous mechanism, by which the main organs can call to their aid, not only each other, but the nervous system as well. It acts in an entirely different way than the biochemical apparatus; it is quicker and more easily studied, because, as I shall proceed to show you, there is a definite part of the nervous system set aside for the sole purpose of correlating the organs in this way. Therefore an organ can either (*a*) defend itself by calling up its physiological reserve; or (*b*) summon other organs to help it, (1) biochemically, or (2) by the intervention of the nervous system.

I. The Physiological Reserve.

This is brought into action when any organ, or probably any cell, in the body is subjected to unusual strain. Unwonted and excessive strain imposed upon any organ or tissue or cell of the body calls for its physiological reserve of (biotic) energy. Just as in health a muscle is never completely relaxed, so in health it is never called upon to contract to its utmost. There is a latent power about it, in reserve for ultra-normal stimulation; and similarly in normal circumstances no organ of the body is required to exercise its full functional capacity. There can be no doubt that this reserve enables an injured cell, if not damaged beyond a certain point, to recover; if the lesion goes beyond this point the power to recover is lost. If disease be overcome by this property there will result what the old pathologists were so fond of talking about, the *restitutio ad integrum*, which unfortunately we do not see so often as we could hope. Still, if it does occur it results entirely from this physiological reserve of energy. You know the effects upon an amœba of increasing strength of stimulation. A mild stimulus causes increased pseudopodial movement, a stronger stuns the amœba and causes it to contract into an apparently lifeless ball, a still stronger kills it. If the irritant is insufficient to cause death, enough biotic energy remains to repair the damage and to ensure recovery. We must go back to this simplest of all cases if we are to understand the phenomenon in tissues and organs. In an organ the effect of supernormal strain is to call up the reserve. When the strain is long continued the reserve may be more or less completely mobilised, and the heart muscle, for instance, like the biceps of a blacksmith, will hypertrophy. This may go on for a considerable period and if the mobilisation is sufficient the condition can hardly be called one of disease. A patient with a hypertrophied heart may, if he live an easy and sensible life, go on as a normal individual. Take, for example, that rather rare condition, uncomplicated aortic stenosis. In these cases, under favourable conditions, the hypertrophic power or physiological reserve of the heart is sufficient to cope with all the needs of the organ and of the body. At the same time the heart, though apparently working efficiently, is not actually doing so, because if it be attacked from another direction—if the reserve has been called out and mobilised, and a fresh enemy appears upon the flank—the army is apt to be thrown into disarray. Again, a patient with mitral stenosis may go on well for several years, living a quiet and apparently normal life, but if he contracts pneumonia the damage to the heart muscle becomes obvious and the machine is thrown out of gear. To change the simile, a patient with compensated valvular disease of the heart is like a man living on his capital. He may not be aware of this until there is a drain upon his bank from some other cause, when he becomes suddenly and acutely conscious that his balance there has sunk to an embarrassing level. This is equally true of other organs, though it may not be quite so easy to demonstrate. A patient may go on with damaged kidneys for an indefinite number of years. Then some acute infection supervenes and the injured organs are unable to withstand the strain. General metabolism has perhaps also suffered, and the patient succumbs or, at any rate, has a severe illness. Thus an intercurrent malady may carry off a patient who has attained an apparent equilibrium. One sees, for instance, persons who have had diabetes for many years die suddenly from coma following an ordinary attack of influenza.

This leads me to digress for a moment in order to mention more particularly one of the chief, though least recognised.

causes of the breaking strain. This is, if I may borrow a term from chemistry, supersaturation. You know that you can dissolve an excess of a salt, such as ammonium chloride or zinc sulphate, in water, more than is normally held in solution. As long as this is not disturbed nothing will happen; but if you drop in a crystal or merely agitate the fluid the whole mass will suddenly crystallise. Now consider the case of a patient who has been addicted to long-continued excess in alcohol, who has soaked his nervous system in this fluid for a number of years. He may inform you that he has taken "a reasonable amount" to drink but that he has never been drunk; nor has he ever had symptoms which have been referable to alcoholism. One day he breaks his leg and the next morning he has delirium tremens, or the same complication develops in the course of an attack of pneumonia. Here you have an example of an organ, the nervous system, which through some physiological power has been able to resist, without appearing any the worse, the action of a poison administered in frequent, smallish doses over a considerable period of time. A certain amount of tolerance has been established, and I think that the question of toleration is largely bound up with, and is at all events a part of, the function of physiological reserve. But a man whose nervous system is saturated with alcohol may be suddenly attacked by the symptoms of alcoholism as the immediate result of a fresh stimulus, mechanical or chemical. So may the diabetic develop coma as the consequence of fatigue or influenza, or the nephritic female uræmia when pregnant. I will go further and venture to suggest a similar explanation in the case of chorea. We know that this is a disease which is almost invariably associated with the rheumatic poison. Whatever may be the actual cause of rheumatism, there can be no doubt that the condition of the patient is one of intoxication: he is suffering, in fact, from the continued effects of a virus. Moreover, after excluding imaginary or long distant alarms, a certain number of attacks of chorea are immediately preceded by an actual fright. This seems to me a parallel case. The patient, coming very often of a neurotic stock, was already supersaturated with the rheumatic toxin and the psychical disturbance resulting from the fright was sufficient to bring about crystallisation—i.e., to determine the symptoms of chorea.

To return to the question of the physiological reserve., If the strain is continued long enough, even in the absence of an intercurrent disorder, the energy of the organ may become exhausted and the reserve be used up; the organ or tissue then suffers what may be described in one word as degeneration. In the heart, the example which we have already chosen, the muscle ceases to hypertrophy and the organ dilates. It dilates because there is a struggle for existence between its different tissues; when the muscle energy is exhausted the connective tissue asserts itself and fibroid or fatty change results. Fatty degeneration is in part a reversion to a type of connective tissue and in part the result of other causes connected with metabolism, while fibroid tissue is the typical plebeian tissue which I have already described as constantly lying in wait for any impairment of the more highly organised and vulnerable structures which it interpenetrates.

This sequence of changes is not less marked in the central nervous system. Of course, this does not hypertrophy in the same way as the heart muscle and it is only during the last few years that we have acquired sufficient technical knowledge to enable us to study the actual changes in its finer elements. We know now that neuronic complexity increases with education up to the age of 40 years at any rate, and that in some cases far beyond that age the neurons may show greater complexity with progressive development of the mental faculties. Here, in fact, there is definite histological evidence of an adaptation to increasing demands, of, in other words, the utilisation of a physiological reserve. On the other hand, the nervous system may give way if the calls upon it are long-continued and excessive, and especially if it has already been damaged by poisons, such as lead, alcohol, or especially the virus of syphilis.

From this point of view the history of an attack of general paralysis is most interesting. You cannot fail to have noticed that even in hospital practice the sufferers from tabes and general paralysis are as a rule more talented and intelligent than the general run of patients. It is even more striking in private practice to observe the sudden breakdown from general paralysis of intellectually gifted people. A patient who has suffered from some infection, chiefly, of course, syphilis, with subsequent hard mental work, and particularly, it seems, one who has been subjected to financial worry, is the most likely subject for this disease. This is once more a question of the exhaustion of the physiological reserve. And here again, as the neurons, the most highly organised cells we know, yield to the strain and decay, the neuroglia, the connective tissue which supports them, assumes the mastery, and the fibrous elements supplant the parenchymatous.

Sometimes it appears that an organ enters upon life, so to speak, with an insufficient physiological reserve. Such an organ is imperfectly equipped, compared with the rest of the body, to resist wear and tear. Hence it is that one particular organ or tissue in any person may exhibit a conspicuous vulnerability, may in fact die before its time within the body. If this organ is of vital importance its owner will die too; the heart and the kidney afford good examples. If the death of the organ does not entail that of the individual more or less maiming must follow. This may be seen in Friedreich's disease, where certain tracts of the spinal cord die before their time, crippling and deformity being the result.

The physiological reserve may play a part in yet one other important pathological process, that of repair. We have already seen that it is the sole means by which this can be effected in the case of a unicellular organism. With increasing complexity of structure division of labour is found among the various constituent cells of a tissue. Thus the repair of an injured tissue is mainly brought about by cells other than those damaged by the noxa. It may well be that in these cells is stored the reserve of biotic energy. In a sense less fanciful than was intended by Grawitz, the inventor of the term, they might be called "slumber cells."

II. THE BIOCHEMICAL APPARATUS.

Now let us consider the means by which one tissue may call upon another for help. The first of these is the biochemical. A good deal has been said during recent years upon the subject of internal secretion, as if it were a special function limited to certain organs. But if you think over the matter it will be perfectly obvious that every cell in the body has an internal secretion, that it takes something away from, and gives back something else to, the common stock. Each cell, therefore, must exert some influence over every other cell in the body, and while in some cases this may be no greater than that of a stone cast into the ocean, in others it is most important, wide-reaching, and vital. Some of these secretions are, in fact, essential to life, though their very existence might never have been guessed at had it not been for the effects of disease or removal of the particular organs in which they are formed. We know, for instance, that the essential product of the suprarenals is a body of comparatively low molecular weight, which is not destroyed by boiling, which can be filtered, which can be sterilised, and which has a distinct action upon all muscular tissue innervated by the sympathetic system, especially the smooth muscle in the walls of the blood-vessels.

The thyroid is another example. Although we are still doubtful as to its exact functions we know that this organ is essential to life. In all probability its use is different in younger and older animals. In the latter administration of thyroid extract is followed by increased chemical change in the tissues and augmented nitrogenous metabolism, while in the former the effects produced seem to be more in the direction of increased growth of the tissues in general and more particularly of the connective tissues, including the bones. In the one case katabolism, in the other anabolism, is the more favoured.

Among other secretions which have been shown to have a definite and effective defensive action is so simple a chemical substance as carbonic acid. It has long been established that an increase of CO_2 tension in the blood, above a certain point, causes violent respiratory movements, quite independently of the physical condition of the lungs. If you perform Head's experiment of positive ventilation with hydrogen, which is an indifferent gas, so that while the lungs are kept expanded the blood is not being aerated, you can differentiate between the mechanical effects of inflating the lungs and the consequences of an altered chemical condition of the blood. In this experiment an expiratory rhythm results, but the inflation which produces it, being with hydrogen instead of oxygen, is useless to the animal. The hydrogen, without being an actual poison, is, vitally speaking, useless, and

after a brief interval violent curves, inspiratory as well as expiratory, are seen. These have recently been shown to be due not to the want of oxygen but to the presence of carbonic acid; in other words, the CO_2 produced in the tissues is the defensive agent which calls up violent respiratory attempts to obtain more oxygen for the carrying on of vital processes. This is the simplest example of a chemical messenger, or, as we now call it, hormone, which one tissue can send to another.

Some of these secretions exert a definite stimulant action upon various organs. I have mentioned the suprarenal with its special motor or constrictor influence upon the smooth muscle in the arterioles. One—namely, the digestive mechanism—will serve as an appropriate example, if I give an outline of some of its phenomena. The whole of digestion is a continuous chain of these biochemical responses, which have been called by some reflexes; to employ this term, however, is to attempt to undo all the work which has been done with regard to the differentiation between biochemical and nervous mechanisms. The most conspicuous example, and the only one which I shall give you now, is that of the process of digestion in the upper part of the small intestine. At intervals during gastric digestion a small amount of acid chyme is ejected through the pyloric opening. This acts upon a substance formed in the wall of the small intestine, known as prosecretin, and converts it into secretin. Secretin, which is not a ferment but a true hormone, is then absorbed by the blood and gets to the pancreas. It has been shown experimentally that, when administered to the pancreas, secretin causes a free flow of pancreatic juice, which contains a large amount of trypsinogen. So that prosecretin is converted by chyme into secretin, and secretin evokes trypsinogen. Trypsinogen, when it reaches the intestine, produces the flow of a ferment known as enterokinase. It is not at present certain that trypsinogen is the only factor which causes the outpouring of enterokinase. It may be that mechanical stimulation of the intestine has something to do with it, but all the most recent evidence is in favour of the view that it is trypsinogen, and trypsinogen alone, which stimulates the secretion of enterokinase. Enterokinase now reacts on trypsinogen and converts it into trypsin, which, as you know, in an alkaline medium, digests proteids. But there is something else in addition, because with the trypsinogen, some alkali is also passed out into the small bowel. When this alkali is in sufficient quantity to be in excess of the acid of the chyme, and when in consequence the contents of the duodenum become alkaline, they cause the pyloric sphincter to relax and open. This permits more chyme to come through and the acid which it contains starts the whole mechanism over again, which goes on until the stomach is empty. You will see, therefore, that the pancreatic juice, when evoked by secretin, does two things. It has in it in the first place the trypsinogen, which stimulates the presence of enterokinase, which converts trypsinogen into trypsin, and so digests proteids, and secondly, carbonate of soda, which neutralises the acid of the chyme until a point is reached when alkali is in excess, when the pyloric sphincter is opened and more chyme is poured out. Here, then, is a beautiful example of the interrelation of chemical processes as seen in a physiological act, and the more we know of the nature of digestion the more does it appear to be built up of phenomena of this description; so that in the practical consideration of diseases of the digestive organs we have to begin with this kind of study. And it must be remembered that in normal circumstances all these activities are entirely latent. Prosecretin appears to have no action whatever upon the pancreas. If you inject it into the pancreas no secretion of pancreatic juice will result. Trypsinogen possesses almost no proteolytic power; it is not rendered effective in this respect until modified by enterokinase. It is only in these special circumstances, and by the aid of such biochemical responses, that these secretions perform their function, and the whole mechanism must be in full working order for the process of digestion to go on properly.

In other cases, which have been much discussed lately, so that I may summarise them very briefly, the internal secretions may stimulate actual growth. I may here refer to the very striking experiments of Shattock and Seligmann on the relation of the development of masculine characters to the growth of the testicles. By comparing the results of castration and double vasotomy in sheep and fowls they found that the appearance of male-type characters—horns, spurs, &c.—was prevented by the former but not by the latter, the operations being, of course, performed upon the animals soon after birth. Maleness hence appears to be due to the presence of testicles and not to the procreative capacity of the animals. Moreover, if testicular tissue be grafted in the abdomen, the testicles having been removed, the animal still develops male characters. It is thus evident that the impulse to this species of growth is excited by chemical and not by nervous stimuli.

This has also been worked out particularly in connexion with the mammary gland. Of course, it has long been well known that if the spinal cord of an animal was divided during pregnancy, after parturition the mammary gland started secreting milk as usual, although no nervous connexion existed between it and the uterus. This has been recorded in many cases in the human subject; I remember one which occurred at Charing Cross Hospital a few years ago. Goltz has also demonstrated the same thing most conclusively upon a bitch from which he had removed the whole of the lower part of the spinal cord, so that there can be no doubt that it is a biochemical action which evokes the mammary secretion. The next step was the research of Marshall and Jolly upon the corpora lutea. They found that the ovary formed an internal secretion which was responsible for the function of menstruation, and that when the ovaries were removed menstruation could not occur. Moreover, the corpus luteum contained an internal secretion, which had to do with the fixation and development of the ovum in the early days of pregnancy. That is to say, that if the corpus luteum were removed in an animal soon after impregnation the ovum did not become fixed and did not develop, whereas if it were removed after half the period of gestation had passed development was not interfered with in any way.

This work has been rounded off by a long series of experiments by Starling, having for their object the endeavour to find a means of stimulating the secretion of the mammary gland in unimpregnated animals. He found that he could make an extract from the bodies of fœtal rabbits which, when injected into virgin rabbits, produced development of the mammary glands. This extract could be boiled and passed through a Berkefeld filter without losing its properties. It is a hormone, a true chemical product, comparable with suprarenal extract. If injected into a rabbit which had borne young but was not pregnant, it caused the mammary gland to develop and to a certain extent to grow. He came to the conclusion that the fœtus in utero pours forth through the placenta an internal secretion into the mother, stimulating mammary growth, and that if during the first half of pregnancy the ovum be removed all that results is atrophy of the glands, which at this time have developed to a certain extent but consist mainly of ducts. Removal of the fœtus, however, during the second half of pregnancy acts as a stimulus to the breaking down of cells which by this time have been formed in the mammary gland. Their breaking down under this inhibitory stimulus leads to the secretion of milk. This corresponds with what is known in actual obstetric practice—namely, that the expulsion of the ovum before a certain date results in the mammary gland returning to its former condition, whereas if it occurs afterwards the inhibitory stimulus of the removal of the internal secretion causes the production of milk by katabolic changes in the gland. We here have a most typical example of response to a biochemical messenger—the hormone.

Now and then we seem to discern abortive attempts at the development of these chemical activities. We know that in exophthalmic goitre the thymus is hypertrophied. We know that in acromegaly the thyroid is apt to enlarge. We may regard these as efforts to come to the rescue when damaged organs are sending broadcast appeals in the form of chemical stimuli, to which the various glands try to respond, though in these cases unsuccessfully.

In addition to such efforts to meet special needs there are many other chemical processes of a defensive nature daily at work in the body; these have been carefully studied by Herter. It will perhaps be as well to outline some of the principal examples.

Poisons are constantly generated in the course of digestion; acetic and lactic acids, indol and phenol, albumoses and peptones, are always being formed in quite large quantity in the intestines. Other poisons, again, are developed in the course of metabolism. Ammonia, which is a virulent organic poison, is always found in considerable amount in the portal vein after a meal, but is normally screened from the general

circulation by chemical changes in the liver. Its presence in excess in the blood or urine is usually the harbinger of evil. Then, again, carbamic and oxybutyric acids may be formed in a somewhat similar manner. Many internal secretions, such as, for instance, that of the suprarenal, if administered in quantity, are poisons, and such an internal secretion which is continually poured into the blood must, unless neutralised in some way, become poisonous. There must hence be a certain number of detoxicating influences at work in the body which prevent these poisons from acting. Such influences are grouped by Herter under three different headings: (*a*) processes of oxidation and reduction; (*b*) processes of hydration and dehydration; and (*c*) processes of synthesis.

(*a*) Oxidation gets rid of poisons such as alcohol and acetic acid. We know also that indol, which is produced in considerable amount in the intestines from albumoses and peptones, must be changed in some similar manner. The oxidation which occurs in the tissues usually demands the presence of iron, the alternation between ferrous and ferric salts being associated with the oxidation of bodies which require it. It may be that in other cases, as, for instance, butyric acid fermentation, nascent hydrogen is evolved; this liberates the atoms of nascent oxygen from the molecules and so causes the formation of an acid product. Oxidation cannot go on in the body except in an alkaline medium so that the presence of oxidation depends upon that of bicarbonate of soda, which is the chief alkaline constituent of the blood, and acts no doubt by virtue of its hydroxyl ions. With regard to reduction, you will remember that the injection of methylene blue into the body, as devised by Ehrlich, causes certain organs to become blue while others remain of their normal colour. These latter are those in which reduction is going on, as methylene blue is decolourised when reduced.

(*b*) Respecting hydration and dehydration, I need only mention the albumoses and peptones. We know that these bodies are formed from native proteids by hydration; moreover, as they are reconverted into native or tissue proteids somewhere in the body, a process of dehydration is also implied.

(*c*) Many intracorporeal syntheses are well known; I may refer, as examples, to those of hæmoglobin, of fat from carbohydrates, of hippuric acid from benzoic acid and glycocoll. But there are others, a little more recondite perhaps, which are of especial value from the defensive standpoint. An important example is the protection from acid intoxication by means of syntheses. Acid intoxication is a very prominent terminal feature of such a disease as diabetes. The presence of an excess of acid in the blood is a matter of almost inevitably fatal import. There are, however, certain bodies which are ready and able to combine with and to neutralise the acid; the chief of these is ammonia. Ammonia compounds and carbamic acid are built up into urea, which is not a toxin, and similarly when there is a possibility of acid intoxication ammonia tends to neutralise the acid, and ammonia salts are consequently found to excess in the urine. If, therefore, in the course of a case of diabetes, late in which disease the diurnal excretion of urea is usually increased, there is a drop in the amount excreted and a corresponding rise in the ammonia salts, this is of evil omen, and calls for immediate attention, as it is probably a warning of acid intoxication and therefore of diabetic coma. Other salts may to some extent take the place of ammonia, and of these sodium salts and in particular sodium carbonate are the most important in protecting against this intoxication. Thus among the numerous and varied actions of the liver none is more important than its detoxicating power by which it screens the body from the ill-effects of many of the products of digestion and metabolism.[1]

III. THE NERVOUS MECHANISM.

The third permanent line of defence is the nervous system; with regard to this I propose only to say a few words now, as its functions are so much more familiarly known. It was at one time more exclusively studied from this point of view than any other part of the body, in fact, all associated action was believed to be either "sympathetic" or "reflex" through the nervous system. Just at present it is, however, rather under a cloud owing to the great strides which have recently been made in our knowledge of the chemical factors in the correlation of organs. This is, perhaps, a little unjust, for there can be no doubt but that the nervous system plays a most important part in calling one organ to the support of another. Of this no more valuable example need be quoted than pain, which is almost always a safe guide to the presence of something abnormal and requiring our attention. Pain should therefore not be regarded merely as a thing to be done away with by means of analgesics, but as one of the most important symptoms of disturbance in the organic equilibrium. Thus, were it not for the immobility caused by the pain of dislocation or fracture much more damage would be done by the injury. John Hilton's great work, "Rest and Pain," which is, I fear, but too seldom read nowadays, abounds with examples of the beneficent work of the latter.

In addition to this general mechanism there is a special part of the nervous system set aside for reflex action and for responding to the calls of damaged organs. This is the autonomic nervous system, which is an efferent system dependent upon the sympathetic ganglia, and their branches. It has to do mainly with vascular and glandular reflexes and is known to us chiefly through the admirable researches of Langley; it is one of the most important agencies in the maintenance of blood pressure and in the regulation of secretion. I would at present merely point out that, as in the course of evolution we meet first with the physiological response, secondly with the biochemical response, and thirdly with reflex action, so the physiological response is ever ready to act but is lowly organised, the biochemical is more highly organised, and the nervous system the most specialised of all. Physiological reserve takes days, or weeks, or months to be fully established, the biochemical response takes minutes, while a reflex act occupies but the fraction of a second. The last named may be compared to the navy, which is, or should be, always ready for action; the second to the army, which should be capable of rapid mobilisation; while the physiological reserve is like the militia, oldest in origin and requiring most time to become efficient. Such has been the evolution of the successive lines of defence to meet the needs of the increasing complexity of the organism. And of all of them it must be borne in mind that they may interact; thus a chemical change may cause a nervous response. Excess of CO_2 in the blood acting upon the respiratory nerve-centres in the medulla will produce respiratory movements.

And in the most highly specialised examples of all, where the activity of an organ is of truly vital importance, you will find not only a very elaborate mechanism but in many cases a double mechanism. In the case of respiration, as we have just seen, there is a nervous mechanism acting through the vagi as afferent nerves, and at the back of this, and independent of it in origin, there is a chemical one, controlled by the venosity of the blood in the medulla. In that of the heart we know that the rhythm is myogenic, depending upon the cardiac muscle alone, but that there is also an escapement, a further control by means of the nervous system, so that in these really essential acts of the body there is help from two sets of defensive apparatus.

Nor may we imagine that we know all about these mechanisms. Substantiate them as we may by laboratory experiment, we cannot but feel that in many cases within the living body there may be a "short circuit," a simpler solution of vital problems than can be attained under artificial conditions. And, moreover, we have some evidence that actions may go on in opposite directions in test-tubes and in the body. Diphtheria antitoxin is an excellent medium on which to cultivate diphtheria bacilli, but when injected into the body it not only neutralises their products but seems also to interfere with their growth. To argue from extracorporeal to intracorporeal processes is sometimes little more than absurd. Take, for instance, the coagulation of the blood. Outside the body this is a normal process, having for its object the closure of wounds; inside the vessels it is abnormal and fraught with grave danger. It is to the advantage of the body to favour the one and to hinder the other; so we find intravascular clotting difficult to produce but extravascular difficult to hinder. What are the causes underlying this reversal, so complete and so important? No blind and wholesale application of the facts of physiology to the needs of clinical medicine is here possible. The more extended study of the properties of biotic energy may perhaps reveal in the midst of apparent complexity the bases of organic economy.

[1] Under this heading might reasonably be considered the normal bactericidal action of certain cells and juices. But this part of the subject is more conveniently, if not more logically, to be treated in connexion with the question of immunity.

ABSTRACT OF

The Goulstonian Lectures

ON

CERTAIN ACUTE INFECTIVE OR TOXIC CONDITIONS OF THE NERVOUS SYSTEM.

Delivered before the Royal College of Physicians of London

BY E. FARQUHAR BUZZARD, M.D. OXON., F.R.C.P. LOND.,

ASSISTANT PHYSICIAN TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE, TO THE ROYAL FREE HOSPITAL, AND TO THE BELGRAVE HOSPITAL FOR CHILDREN.

LECTURE II.[1]

Delivered on March 7th.

MR. PRESIDENT AND GENTLEMEN,—Having in my first lecture referred to the general principles of acute infective or toxic processes in the nervous system, I propose to turn my attention at once to the consideration of the four diseases—acute poliomyelitis, acute ascending myelitis, Landry's paralysis, and acute toxic polyneuritis—and to the discussion of the various interesting questions with which their origin and nature are associated.

ACUTE POLIOMYELITIS.

Not only on account of its comparatively great frequency, of its lamentable and cruel results, but also because its investigation raises many important questions, acute poliomyelitis undoubtedly claims our first attention.

The name.—The two names by which this disease is commonly known are "acute anterior poliomyelitis" and "infantile spinal paralysis." To the first, two objections may be made on the grounds of its length and of its accuracy. The omission of the word "anterior" is a remedial measure suggested by Wickman which is certainly successful in removing the former objection, and, with regard to the latter, has obvious advantages in that it renders the title, as we shall see later, more nearly descriptive of the limits of the disease. The term "infantile spinal paralysis" has little to recommend it, because at the present time most authorities will allow that the disease is common, although in varying degrees, to at any rate the first four decades of life. If we remove the word "infantile" from the name "infantile spinal paralysis" we are left with a far too general term to be of any use. For these reasons I prefer the title "acute poliomyelitis" and do not make any distinction between an infantile and adult form.

MORBID ANATOMY.

Historical.—In order that we may, during the description of anatomical lesions, bear in our minds the various views which have been offered for their explanation I will narrate shortly the pathological history of the disease.

While studying the details of morbid anatomy we shall have to bear in mind several different theories offered for their explanation. 1. A primary degeneration of the ganglion cells of the anterior horns with secondary interstitial fibrosis. 2. An inflammation of the interstitial tissues of the spinal cord due to blood-borne infection with secondary or coincident injury to the ganglion cells. 3. A similar condition, but one which originates and spreads in the lymphatic system—a lymph-borne infection. 4. A primary thrombotic or embolic process in the distribution of the central artery.

Anatomical.—As a basis for the study of the morbid anatomy I will take the case of a man who died from the disease within four days of the first symptoms of illness and within 36 hours of the onset of paralysis. Portions of the central nervous system of this case were kindly sent me by Dr. C. R. Elgood. An athletic man, aged 26 years, with no important preceding illness except a doubtful history of syphilis some years previously complained for two days of pain in the back and limbs and developed a slight pyrexia. On the third day he was confined to bed with a temperature of 101° F. and a furred tongue. The following morning he was paralysed in the legs and during the day the paralysis involved the trunk and respiratory muscles and death from respiratory failure occurred at midnight. There had been no mental impairment, no loss of cutaneous sensibility, and no disorder of the sphincters. The portions of the nervous system which I had the opportunity of examining were the lower dorsal and upper lumbar segments of the spinal cord together with the medulla oblongata and pons Varolii.

The spinal cord.—All the spinal segments presented similar microscopical features and the description of a section from the twelfth dorsal will suffice for our purpose. Even with the naked eye a section stained with logwood presents a striking difference from the normal. The grey matter stands out from the surrounding white columns unusually well owing to dense accumulation of nuclear elements within it. Under a low power this appearance is accentuated and, in addition, one is struck by the fact that the anterior spinal artery and its branches and a large number of the chief radial vessels are rendered prominent by the intense cellular infiltration of their walls. This condition obtains with regard to the vessels both in the antero-lateral and posterior columns and is often present in the vessels entering with the posterior roots. A more detailed examination shows that most vessels, whether in the white or grey matter, are distended with blood which presents no evidence of ante-mortem coagulation, and that capillary hæmorrhages or red cell extravasations are scattered about. In the grey matter it is noticeable that although the nuclear elements are everywhere in excess of the normal they tend here and there to be gathered together in dense foci which may or may not have any obvious association with vessels. These foci are to be seen in the posterior as well as the anterior horns and are often well marked in the neighbourhood of Clarke's column. Even when carefully looked for with higher powers it is difficult to find more than a very few of the anterior horn cells and the majority of these are much changed; they are usually swollen, rounded, and devoid of protoplasmic granules, while their nuclei are often enlarged and excentric. The cells of Clarke's column are similarly affected, although not so completely submerged in surrounding cellular exudation. On the other hand, the white matter is practically free from accumulations of nucleated cells, although the cellular infiltration of the vessel walls is marked, and the neuroglial cells are possibly in some excess. In contradistinction to the grey matter where it is nearly impossible to distinguish the constituent axis cylinders and ganglion cells, in the white matter one is able to detect the usual appearance of axis cylinders and myelin sheaths cut in transverse section, although both axons and sheaths are sometimes swollen, especially in the antero-lateral columns. The soft meninges are also the seat of cellular infiltration, generally confined to the anterior median fissure and the antero-lateral surface but occasionally on the posterior aspects of the cord as well. The cells lie in the spaces of the connective tissue network, which are consequently enlarged and are more numerous in the neighbourhood of vessels.

Medulla and pons.—The changes seen in the pons and medulla are less intense, similar in character, though different in distribution to those of the spinal cord. General hyperæmia with cellular infiltration of the vessel walls is general throughout these regions. Cellular foci in the tissues are scattered irregularly, chiefly in the central formatio reticularis but sometimes in the neighbourhood of the nuclei in the floor of the fourth ventricle. Definite ganglion cell changes are confined to those cells which are in the immediate proximity to the cellular foci in the tissues and consist of chromatolysis with or without excentration of nuclei.

So far I have only referred in general terms to the cellular infiltration of the grey substance, of the vessel walls, and of the soft meninges, each of which must be considered separately in greater detail and in the light of their appearances under high powers and different methods of staining. This would have been very incomplete in the particular case I have been describing, owing to the method of fixing the material, but I have been fortunate enough to supplement this by the examination of two other cases, both of five days' duration, from which sections were prepared by Dr. Gordon M. Holmes with the Heidenhain and the Unna-Pappenhaim methods in the laboratory of the National Hospital. To the generosity of Dr. Donald W. C. Hood and of Dr. F. E. Batten I am deeply indebted for permission to refer to these sections. In both these cases

[1] Lecture I. was published in THE LANCET of March 16th, 1907, p. 705.

the general appearances I have already described were present in greater or less degree throughout the spinal cord and extended with fading intensity as high up as the optic thalamus.

Cellular infiltration of vessel walls.—This may well be taken first as it is the most widespread change in cases of acute poliomyelitis. In almost all fatal cases it has been found throughout the cord and brain stem and in many it has been traced as far as the cerebral cortex in the one direction and the conus terminalis in the other. The vessels of the grey and white matter are affected alike, veins, capillaries, and arteries all sharing in the process. On the whole the veins and capillaries show, proportionately to their size, a more intense infiltration than the arteries. The cells are seen within the adventitial sheath and often crowded between the media and adventitia in such a way as to bring into prominence a space to which I referred in my first lecture as the lymphatic channel described by Virchow, Robin, and others. The cells constituting this infiltration of the adventitia may be divided into several classes.

1. Cells which have all the morphological characteristics of the lymphocytes of the blood—single round or nearly round nuclei which stain deeply with most dyes, with a narrow rim of protoplasm which is often invisible in logwood sections but which can be generally distinguished by the Heidenhain and Unna-Pappenhaim methods. With the latter staining this protoplasm stains a distinct and nearly homogeneous pink. The cells of this class form the large majority of all those contained within the vessel sheath, probably representing a percentage of 80.

2. Cells which are similar to the last class except in the fact that they have more protoplasm. They include all the intermediate forms between the lymphocytoid cells and somewhat larger cells which strongly resemble the plasma cells described by Unna, Marschalko, Vogt, Mott, and other observers in various conditions. These plasma cells are generally oval or oblong in shape, with a rounded nucleus lying either centrally but more frequently at one end. The protoplasm with the Unna-Pappenhaim method is a rather bright pink and contains very fine granules. The nucleus resembles that of the lymphocytes except in respect to the chromatin granules which are sometimes more dispersed towards the nuclear membrane. These intermediate cells and plasma cells are found in a proportion of about 10 per cent.

3. In the remaining 10 per cent. are included several different types, each of which is so scantily represented that it requires little attention. There are a few larger mononuclear elements, a few large cells of about the same size with horseshoe-shaped nuclei, a few polymorphonuclear leucocytes, and a few cells with oval clear nuclei and very indistinct protoplasm, probably endothelial in origin.

All the cells I have now referred to are definitely within the meshes or lymph spaces of the adventitial sheath and are quite separate from the surrounding nervous substance; there is, in fact, not the slightest ground for believing that any of them are derived from the neuroglial elements. The infiltration of the vessel walls has been mentioned under the name of perivascular round cell infiltration by all observers who have examined cases of poliomyelitis in the acute stages but most of the earlier investigators have regarded them as emigrating leucocytes. At the present time there is much disagreement with regard to the origin of these lymphocytic and plasma cells and the various views are somewhat as follows.

The origin of these cells is not yet fully understood and I will content myself with merely summarising what is definitely ascertained. In many infective processes of the central nervous system the most marked inflammatory reaction is the perivascular cellular infiltration. In the acute stage of poliomyelitis this infiltration is conspicuous and consists mainly of cells which resemble lymphocytes and of cells which appear to be developing from the latter. The evidence is in favour of their being derived from cells already present in the walls of the vessels and against the view that they have migrated directly from the blood stream. A few polymorphonuclear elements are to be seen but there is no evidence of a free exudation of these cells.

Cellular infiltration of the soft meninges.—This subject is best considered next because the cells which are found here are practically identical with those found in the vessel walls. As I have already mentioned, the infiltration is generally more marked on the antero-lateral surface of the cord than on the posterior, though it has been seen all round in the lower part of the sacral region. It is usually less evident in the higher levels of the cord, but has been traced as far as the posterior end of the fourth ventricle and even to the optic chiasma. In the three cases I have examined the great majority of cells contained in the pia arachnoid are of the mononuclear type; a smaller number show the various intermediate stages between the lymphocytic and the plasma cell characters. Only a very small percentage of other cells are to be seen and among these are a few polymorphonuclear leucocytes. Wickman, Dauber, Bickel, Sherman and Spiller, Goldscheider, Williamson, Bulow-Hansen and Harbitz have all found the meninges infiltrated with round cells in cases which have died within a short period after the onset of the disease. That it is not a feature only of fatal cases is shown, as Wickman mentions, by the fact that lymphocytes have been found in the cerebro-spinal fluid during life in non-fatal acute cases. In the case under the care of Dr. Hood, to which I have already referred, a lumbar puncture during life showed the presence of 95 per cent. of lymphocytes in the cerebro-spinal fluid.

Cellular infiltration of the grey matter.—Under this heading I shall refer, not to the cells of the vessel walls which I have already described, but to the masses of cells scattered more or less irregularly throughout the grey matter, particularly, but not exclusively, in the anterior horns. This part of my subject presents great difficulties, for it is one thing to describe the cells which can be seen in these regions and quite another to give them a name or to suggest their origin. Two sources of error may be mentioned; in the first place it is often impossible to distinguish between a small round neuroglial cell and a lymphocyte; in the second place, it is obvious that many cells are proliferating or have undergone changes comparable to the swelling and chromatolysis and excentration of nuclei which are prevalent in the ganglionic nerve cells in this inflammatory process—changes which render them quite devoid of their characteristic features and often unrecognisable. Making due allowance for these facts there appear to be the following cells present in the tissue. 1. Large and small Deiters's cells of the neuroglia, a few of which present their normal characters but the majority of which are altered. Some are swollen and contain one or two large vesicular nuclei but retain some portion of their processes. Others have lost all processes, are swollen, rounded or oval or irregular in shape, and contain excentric, lobulated, or multiple nuclei. It is probable that many of them are on their way to become compound granular cells, the fat-scavengers in the process of disintegration, which form a prominent feature in slightly later stages of the disease. 2. Small rounded neuroglial nuclei with a thin rim of protoplasm. Some of these are also altered, the nuclei swelling and becoming more vesicular with fewer or more widely separated chromatin granules. The cells of this class are often indistinguishable from the lymphocytic type. 3. Cells which resemble lymphocytes and are probably identical with the cells in the perivascular sheath from which they have wandered. As in the adventitia of the

DESCRIPTIONS OF ILLUSTRATIONS ON PAGE 787.

Fig. 1.—Twelfth dorsal segment of a case of adult acute poliomyelitis fatal within 36 hours of the onset of paralysis. The grey matter stands out more prominently than normal on account of the cell proliferation which has taken place, and the chief vessels of the white matter are also picked out owing to the cellular infiltration of their adventitial sheaths.

Fig. 2.—The cells of Clarke's column and the inflammatory exudation around in a case of acute poliomyelitis within 36 hours of the onset of paralysis. The nerve cells are swollen and chromatolytic, with excentric nuclei.

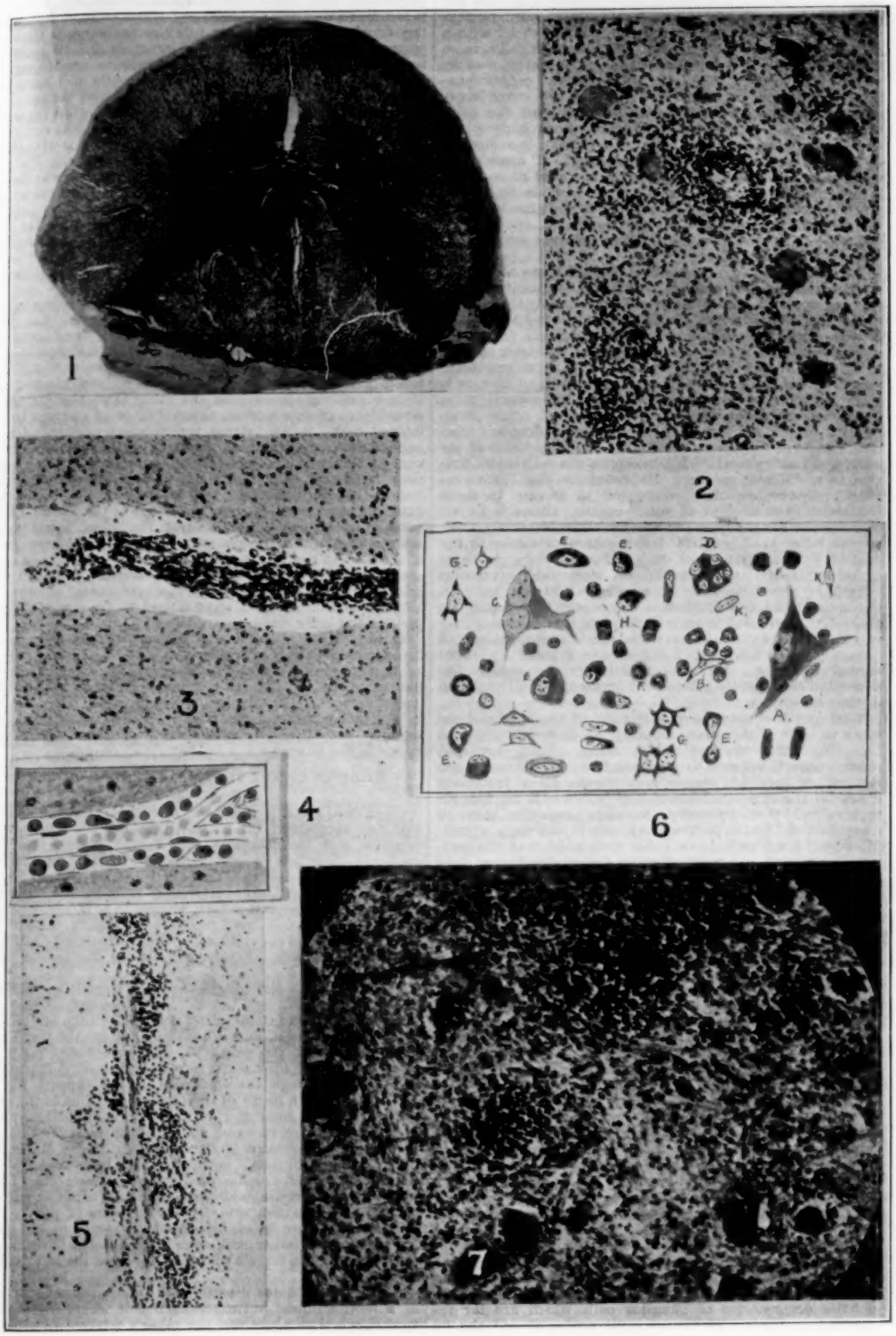
Fig. 3.—Reproduction of photograph of a vessel in the posterior median septum in a case of acute poliomyelitis of five days' duration, showing the intense infiltration of the adventitial sheath.

Fig. 4.—Diagrammatic drawing to show the cells lining a very fine vessel in acute poliomyelitis.

Fig. 5.—The reproduction of photograph shows the cellular infiltration of the meninges on the anterior surface of the cord especially around one of the anterior root bundles.

Fig. 6.—Cells of grey matter in acute poliomyelitis stained by the Heidenhain method. A, Small nerve cell with encroaching migratory elements. B, A mesodermic connective tissue cell. C, A large Deiters's cell with two nuclei. D, Neuroglial cell with many nuclei. E, Probably other forms of altered neuroglial cells. F, Polymorphonuclear leucocytes. G, Small Deiters's cells. H, Plasma cells and transitional types. K, Endothelial cells.

Fig. 7.—Anterior horn in lumbar region from a case of acute poliomyelitis of five days' duration. Unusual survival of the nerve cells amidst the intense inflammation of the interstitial tissues.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vessel walls and in the meningeal interspaces, so here one can recognise the deeply stained chromatic rounded nucleus with little or no visible cytoplasm, similar nuclei with a definite cell body and nuclei lying excentrically in a larger cell of oval or oblong shape. The latter may be regarded as plasma cells. 4. A few definite polymorphonuclear cells can be detected and there are other larger cells which may or may not be elements of the same type which have undergone swelling and other changes. In any case polymorphonuclear cells are certainly not numerous. 5. In most sections connective tissue cells of mesodermal origin are to be observed even when no vessel or capillary is seen in their neighbourhood. It is possible that these are either wandering cells or that the section has traversed the adventitial sheath of a vessel tangentially. Endothelial cells are also to be seen and their presence may be explained in a similar manner.

Excluding all the cells I have described there are still a considerable number which it is difficult to classify and for this reason it is impossible to gauge accurately the relative proportion of the various elements. My general impression is that neuroglial proliferation and lymphocytic (using the word purely with regard to morphological character and not in relation to origin) infiltration are the most prominent factors in the production of these cell masses. This view is more or less in accordance with that of several other observers, but Schmaus in a typical case of acute poliomyelitis, which he describes under the misleading and composite name of "acute hæmorrhagic myelitis, myelitis of the bulb, and Landry's paralysis," interprets the cellular infiltration in a different manner. He maintains that there is as much polymorphonuclear emigration as is seen in acute inflammatory conditions of other organs, although he recognises the lymphocytic and other varieties as well. Nissl, on the other hand, regards inflammatory processes in the central nervous system as on a different plane to those of other tissues. According to his view the perivascular adventitial sheath forms a biological boundary line between the mesodermal and ectodermal tissues and inflammation is generally represented by an infiltration of this sheath. Only in exceptional circumstances when the tissues are damaged does the nerve substance itself become invaded by mesodermal elements. In the central nervous system the neuroglial cells largely take on the duties of the polymorphonuclear leucocytes.

Wickman does not support this view of Nissl and inclines more to that of Schmaus, although he finds difficulties in accepting either the one or the other. From my own observations it appears to me probable that the round cell infiltration both of vessels and tissues is a prominent characteristic of acute inflammatory processes in the nervous system and that polymorphonuclear exudation plays a comparatively small part at any rate in the early stages. Moreover, I am inclined to agree with Nissl that the perivascular sheath and lymphatics, on the one hand, may tend to control the exudation, and the activity of the neuroglial cells, on the other, to compensate for its moderate dimensions.

The white substance.—True foci of cells apart from the infiltration of the vessel walls are rarely seen in poliomyelitis and I have found no instance in my cases. Wickman mentions it as occurring exceptionally in his seven acute cases but in no instance was the focus of any great extent. I have already referred to the perivascular infiltration which does not differ essentially in the white from the same process in the grey. Under high powers and with suitable methods of staining it is evident that the neuroglial cells in the white matter are undergoing changes similar to those seen in the neuroglial substance of the grey matter; the Deiters's cells are swollen and contain two or more nuclei; some lose their processes and become surrounded and vacuolated; the small round cells show swelling both of their nuclei and their protoplasm. On the whole, the changes are not nearly so intense as those seen in the grey matter.

The ganglion cells.—The ganglion cells of the anterior horns, of Clarke's column, and of the posterior horns all suffer in varying degrees. Speaking generally, those cells undergo the greatest change which are most closely involved in the inflammatory exudation, but this rule has its exceptions and occasionally remarkably healthy-looking cells are met with surrounded by intense proliferation of the tissue elements. On the other hand, it is most unusual to encounter definite degeneration of ganglion cells which are far removed from the foci of disease. All grades of cell change are present from early chromatolysis to a condition in which it is difficult to detect the cellular outline or to differentiate the constituent parts. As a rule the nucleolus is the last portion of the cell to retain its structure and its staining reaction. Within the pericellular precincts are frequently seen small round cells of the lymphocytic or neuroglial variety, some of which are in close contact with the ganglion cell and others perhaps within its substance. How far there is definite neuronophagia it is difficult to say, but certainly extensive degeneration of the cell can take place with little or no invasion of its surface by wandering elements.

The central canal.—In my cases it is impossible to detect changes in the contents or walls of the central canal which are not seen in normal conditions, if due regard is paid to the fact that the cellular infiltration of the grey matter may extend to its immediate proximity. Wickman describes amorphous granular material with occasional round cells within the lumen of the canal but no observer has recorded definite changes in the ependyma.

In summarising the morbid anatomy of acute poliomyelitis as observed by different investigators in cases examined within a few hours or days of the onset of the disease the following points stand out. 1. The most widespread and constant features are, on the one hand, the congestion of blood-vessels and proliferation of the cellular elements of their adventitial sheaths; on the other hand, the absence of all evidence of ante-mortem thrombosis or of changes in the intimal coat. 2. An intense proliferation or exudation of various cells, concerning the origin of which there is a difference of opinion, limited largely to those parts of the central nervous system most freely and generously supplied with blood—that is to say, in the neighbourhood of the rich capillary network of the grey substance of the cord and well-vascularised regions of the brain stem and brain. 3. Round-cell infiltration of the meninges more marked in the lower parts of the cord and on its anterior aspect, but extending in some cases to the intracranial meningeal cisterns. 4. The morbid anatomy of the epidemic and sporadic cases, whether in children or adults, has always proved to be essentially the same in the acute stage.

Time will not allow me to recount to you the many investigations which have been made on the bacteriology of acute poliomyelitis. These observations are of great interest but cannot be regarded as conclusive evidence either of the specificity or non-specificity of the disease. They are not indeed sufficiently complete to prove that in any case the organism which has been isolated has been the causative factor in the disease.

EVIDENCE OF THE INFECTIVE NATURE OF ACUTE POLIOMYELITIS.

On clinical grounds there has now accumulated a mass of evidence supporting the infective nature of acute poliomyelitis, and the fact that the morbid anatomy of the epidemic cases has proved identical with that of sporadic cases gives good reason for the belief that the two conditions are of similar origin and considerable presumptive argument in favour of its specific nature. Some 15 to 20 epidemics of the disease have now been recorded in various parts of the world, the most noticeable being those described by Medin, Bucelli, Auerbach, Pasteur, Painter, Mackenzie, and Nannestad.

In London it is difficult to say when there is an epidemic and when there is not, but it is well recognised that the period from July to October is that in which the majority of acute cases are seen, and Batten pointed out the prevalence of the disease in the year 1904. The evidence of the infective nature of the disease can hardly be deemed deficient and it provides, through the epidemics, strong support for the belief that certain forms of encephalitis are due to the same process and the same morbid agent as acute poliomyelitis. The origin of many cases of infantile hemiplegia in this way was long ago suggested by Strümpell and Pierre Marie, and considerable additional testimony has been adduced by Batten, White and Worthington, and other observers. Lamy recorded an interesting old-standing case of atrophic palsy of the right leg in a man who died at 43 years of age. Post mortem there were found, besides the evidence of old poliomyelitis in the lumbar cord, several old patches of disease in the cerebrum, the largest of which involved the left parietal region.

Sanger and Möbius describe the simultaneous occurrence of a febrile illness in two sisters, one of whom developed a typical spinal paralysis and the other a cerebral hemiplegia.

Marie has contributed a case in which one leg was the seat of a spastic and the other of a flaccid atrophic palsy. Beyer in 1895 recorded the case of a girl who at the age of five years became paralysed on the left side from a cerebral lesion. Epilepsy supervened and the patient died some years later. At the necropsy there were found a porencephaly of the right hemisphere and an old poliomyelitic condition in the left side of the cord. Oppenheim in his text-book of nervous diseases refers to a case of encephalitis of the pons producing facial palsy associated with lumbar and cervical poliomyelitis. E. C. Williams in THE LANCET of 1899 tells us of a case of a school-girl who became paralysed down the right side with aphasia in an acute illness commencing with headache and convulsions. Later examination showed that while the arm was purely spastic the leg of the same side gave evidence of a spinal as well as of a cerebral palsy. Similarly Neurath recounts the history of a child, aged six years, who, during an acute febrile illness, developed right cerebral hemiplegia and atrophic spinal palsy of the left leg. Negro observed the case of an infant, aged 18 months, who in the course of an acute febrile attack associated with convulsions displayed right cerebral hemiplegia and left spinal paralysis. Calabresse has enriched the literature of this subject with two important cases. In the one acute poliomyelitis was associated with ocular palsies, and in the other a spastic hemiplegia, ocular palsies, and atrophic palsy of the other leg were all combined.

There are many cases, therefore, which point to the conclusion that encephalitis of the hemisphere and of the cranial nerve nuclei may have the same origin as acute poliomyelitis, and although the opportunities for examining cases in the acute stage have been scanty we have already seen that in most fatal cases of poliomyelitis the morbid process has extended much higher in the central nervous system than the clinical symptoms at the time of death have suggested. Moreover, Batten and Prickett have had the opportunity of examining the brain in a case of acute encephalitis within a few days of the onset of hemiplegia and have found morbid changes strongly resembling those of acute poliomyelitis.

CLINICAL.

Before entering upon the discussion of the pathogenesis of the disease I must briefly refer to certain clinical features of its acute stage. Generally speaking, the onset of paralysis is preceded by pyrexia, vomiting, convulsions, general malaise, and pains in the head, neck, back, and limbs. In the more fulminating type of case rigidity of the muscles of the neck and back has been noted in the early stages and cerebro-spinal meningitis has been suspected. Just as in the specific fevers, the constitutional symptoms of the infant differ in certain respects from those of the adult. Vomiting and convulsions are more associated with the infantile cases than with the adult although marked vomiting was a prominent feature in the case of a youth, aged 21 years, recorded by Sherman and Spiller. We are, on the other hand, dependent upon the older cases for our knowledge of the character of the pain in this disease and with them it is usually a symptom of considerable moment. They generally complain in the first instance of pain in the head, back, and limbs, of a sharp or burning character, but both before and after this has subsided a most noticeable feature is the distaste for passive movement. This is confirmed by most mothers who have nursed children in the early days of the disease and the fact that the children cannot bear to have their limbs handled is not an infrequent excuse for meagre ablutions. We may, I think, distinguish two types of pain: (1) spontaneous temporary pains in the back, head, and limbs in the early hours of the disease, and (2) the pain produced by movement (reflex pains) generally lasting for a few days even after the temperature has subsided. These facts are in harmony with the anatomical data. As we have seen, an intense congestion of the vessels of the central nervous system together with early proliferation of cells in the perivascular sheath and in the meninges are the most widespread and earliest evidences of the acute irritative process.

From the motor aspect one of the characteristics of acute poliomyelitis is the fact that the initial paralysis is always more extensive than the residual in those cases which survive. If we analyse this more closely in relation to severe cases we can generally find that some muscles are only temporarily paralysed, perhaps only for a few hours or a day or two; others show atrophy and the reaction of degeneration but yet make a comparatively rapid recovery in the course of some weeks or months; finally, there are those which never regain power or in which only a few fibres respond to long and persevering treatment. Here, again, we have anatomical analogues. There are anterior horn cells which resist the morbid influences at work and which, while showing no striking structural alterations, may well undergo some temporary derangement of function. There are cells which show what I have described as the early and moderate type of degeneration but which are capable of restoration, and, finally, there are whole groups of cells which, either entirely or with only one or two exceptions, are irretrievably swamped and destroyed in the surrounding exudation.

One more clinical fact about which little has as yet been written. Since Babinski supplied us about ten years ago with a delicate test for the healthy or unhealthy condition of the pyramidal fibres of the cord, it must have happened to you, as it has on several occasions to me, to have obtained an extensor response on eliciting the plantar reflex in cases of acute poliomyelitis. It is, of course, in only a small number of severe cases that the muscles moving the toes are left intact and that this test is therefore applicable; on the other hand, a careful distinction has to be drawn between a pathological extension and an infantile response. Making due allowance for these facts, there is still a small percentage of cases in which definite evidence of pyramidal tract involvement is forthcoming. I have seen several such cases in children and at least one in an adult to which I will shortly refer. Some years ago I saw a young man, aged 22 years, who during August developed a typical attack of acute poliomyelitis. On my first examination, about ten days after the onset, I found that both the flexors and extensors of the right knee and the flexors of the left knee were powerless, while there was only slight weakness below the knee in either leg. On this occasion the right knee-jerk was absent, the left knee-jerk was present, and neither plantar reflex was obtained. A week later the movements at the ankle- and toe-joints were practically restored and I obtained a well-marked extensor response in both feet; the right knee-jerk was still absent and the left was more brisk than normal.

We have already seen that the white columns of the cord, particularly the antero-lateral, suffer to a moderate extent in the disease, and the marked swelling of the axis cylinders and myelin sheaths noted by all observers in the acute stage sufficiently explains this symptom of organic change in the pyramidal system—a symptom which, I believe, is in some cases only of transient duration.

Another clinical point is worthy of note. In the epidemics and in the family cases, like those of Pasteur and of Below-Hansen and Harbitz, other members of the household have been taken ill at the same time without developing paralytic phenomena. There is evidence, therefore, of the existence of what may be termed abortive cases. On the other hand, there is a great probability that many cases of acute generalised poliomyelitis occur in young infants and rapidly prove fatal without being recognised. The child observed by Drummond who died within six or seven hours from the onset is suggestive of this being the case.

PATHOGENESIS.

We are now in a position to discuss the various theories which have been advanced to explain the nature of acute poliomyelitis. That view, which originated from the examination of long-standing cases and which indicated a primary degeneration of the anterior horn cells and an entirely secondary change in the interstitial tissues, cannot at the present time be taken seriously. The examination of early cases has been its death-blow. The theory which it is most convenient to take second is the so-called "vascular" one, originally introduced by Pierre Marie and supported by Batten in recent years.

I must say at once that by a number of writers the term "vascular" is used erroneously, or at any rate in a way which is apt to lead to a confusion of ideas. The fact that within an area of tissue the vessels are engorged with blood and surrounded by numerous cells which have emigrated from the blood stream or proliferated *in situ* and that there are serous exudations or hæmorrhages, is not in itself sufficient reason for calling the lesion a vascular one. It is generally accepted that all the demonstrable phases of inflammation have to do with the vessels and the blood—in fact, inflammation can only be recognised by vascular phenomena. Thus, dilatation of the vessels, acceleration and

then slowing of the stream, followed possibly by blood stasis and exudation of lymph and cells are the text-book criteria of inflammation. Again, we are taught that three things may happen as a final result—namely, resolution, suppuration, or necrosis due to complete blood stasis and thrombosis. We recognise, therefore, that thrombosis of vessels may occur as a result of inflammation, but the origin of a thrombosis in that way should not incite the observer to call the whole process "vascular." In acute poliomyelitis thrombosis of vessels may be present at the time of examination some time after the onset. Is this thrombosis a primary lesion or is it secondary to an inflammatory process? On this point Batten expresses a decided opinion when he states "that the condition is due to a primary thrombosis of a branch or branches of the anterior spinal artery supplying the grey matter of the anterior horn." Head and Campbell have said, "If by 'vascular' is meant that the disease is directly secondary to occlusion or interference with a vessel we deny its correctness; if, on the other hand, it is meant that the vessels play an important part in the general inflammatory process it is a platitude," and they go on to say that many observers have occluded the vessels of the spinal cord and brain without producing inflammatory changes or hæmorrhages. In answer to this Batten says, "It must be remembered that obliteration of a large vessel is by no means necessarily comparable to the condition which is produced when thrombosis occurs in smaller vessels. Far more to the point are the experiments of Prévost and Cotard (although performed many years ago) with regard to the changes which take place in an infarcted area. By the means of fine tobacco seeds they succeeded in producing infarcts in various organs and they proved by their experiments that congestion, hæmorrhage, and exudation of the cells were the only results of obliteration of small vessels."

Now, the argument that the experiments of Prévost and Cotard prove the dependence of the inflammatory changes on the obliteration of vessels will not, to my mind, hold good. Conclusive evidence on this point is supplied by the work of Hoche, published in 1899. This investigator injected into the lumbar arteries of dogs aseptic material in the form of lycopodium granules, pollen of *Typha japonica*, granules of maize starch, and kamala glands. By these means he produced lesions in that part of the spinal cord supplied by the arteries which had a strong resemblance in certain respects to those of poliomyelitis. The various materials injected were responsible for the formation of numerous embolic softenings or infarcts within the cord of sizes varying with the calibre of the vessel in which the particle became lodged. In addition to the production of necrotic areas, however, there was also evidence of tissue reaction to the chemical irritation of the emboli in the shape of marked cellular infiltration of the adventitial sheath of the vessels both in the white and in the grey matter, identical, so far as one can see, with that found in acute poliomyelitis. The most important fact is that although the infarct production was the same whatever species of emboli were introduced, the degree and intensity of the tissue reaction varied with the chemical nature of the emboli. For instance, the most marked reaction followed the use of kamala glands, less reaction that of the pollen of *Typha japonica*, and little, often no, reaction that of lycopodium granules.[2] It is evident, on these grounds alone, that mechanical blockage of vessels cannot of itself produce the tissue reaction, but the fact is still further emphasised by Hoche's finding that no tissue reaction results unless the source of chemical irritation is brought into close relation with the tissues themselves. If a branch of the anterior spinal artery was blocked by one of the larger emboli just before it entered the grey matter no inflammatory action was produced; on the other hand, when the irritating particles were distributed through the finer branches and capillaries cellular proliferation was induced in the surrounding tissues varying with the chemical nature of the substance used.

What applies to the vegetable material used by Hoche must apply at least equally to the tobacco seeds of Prévost and Cotard and the only evidence in favour of the view that perivascular round cell infiltration can be the *result* of simple thrombosis or embolism falls at once to the ground. But perhaps the best answer to the "primary thrombosis" theory is that no observer who has examined the cord during the first few days after the onset of illness has found thrombosis of any of the vessels. For these and many other reasons into which I will not enter now I am quite unable to support the "primary thrombosis" theory concerning the origin of acute poliomyelitis and it is equally clear from all I have already put before you, both from the observations of others and from my own cases, that whatever agent induces the perivascular infiltration does its work impartially on the vessels radiating through the white columns of the cord and the various vessels supplying the brain stem, as well as on the branches of the anterior spinal artery. Wickman, who has had unequalled opportunities of studying the early stages of the disease, is emphatic on this point.

It may, and probably will, be argued that all cases of poliomyelitis have not an identical pathological basis. It will be said there are cases in which the onset is extremely rapid and associated with little or no constitutional disturbance and with no pain. With these cases I am familiar, but there are one or two points to bear in mind in this connexion. In the first place, there is an enormous variation in the degree of constitutional disturbance with every acute specific fever. We are all familiar with this in the case of measles, chicken-pox, and diphtheria, and we recognise an ambulatory form of typhoid fever, but we do not for this reason exclude the cases with little or no pyrexia, with no loss of appetite, or headache or pains, from the category of those diseases. In the second place, it must be remembered that the paralysis is almost an accidental result of the disease depending on the involvement of the anterior horn cells by the inflammatory exudation, and that the latter may only here and there be sufficiently intense to affect the former. A considerable amount of widespread subacute inflammation may therefore be present with no, or very little, indication in the way of paralysis or of constitutional disturbance. In the third place, we often have to deal with cases in which the acute stage is a matter of more or less remote history and the reliability of witnesses on these points is proverbially insecure. At the same time, after making due allowance for those sources of error, I am prepared to admit that there are a very limited number of cases in which the suddenness of onset and the narrow limitation of the paralysis do suggest the possibility of a true vascular lesion of the cord. I have, indeed, suggested elsewhere the same possibility in relation to the occurrence of certain peripheral palsies limited to the distribution of a single nerve root. On the other hand, I know of no confirmation on histological evidence of either the one or the other if cases of hæmatomyelia are excluded.

Having now rejected two of the theories which have been put forward for the explanation of acute poliomyelitis, I think we are in a position to say that the process is an inflammatory one and probably due to the influence of some micro-organism or its toxin. There are two questions, at least, still to be answered—1. Has the toxin a special affinity for any particular tissue? 2. Is the toxin brought into relation with the tissues of the central nervous system through the medium of the blood or of the lymph, if, indeed, a fair distinction of this kind can be drawn?

With regard to the first question we are at once struck by the fact that the most intense reaction is found in association with those parts where ganglion cells are most numerous, especially in the spinal cord. Does this indicate a chemical affinity on the part of the poison for the true nervous elements? Not necessarily because, as I have already pointed out, the regions in which nerve cells are present are also the regions where blood-supply and capillary network are always the richest. The same parts, therefore, are most freely bathed with blood, probably with lymph, and most easily accessible to the poison carried by these fluids. On the whole, the evidence favours the view that there is no special affinity on the part of the toxin for the nerve cells and that the latter suffer chiefly through the inflammation of the tissue which supports them. The healthy condition of cells away from the foci of inflammation and sometimes in their immediate neighbourhood points strongly in this direction.

The other alternative is that the poison exerts a special influence on the neuroglial tissue and in favour of this there is a good deal to be said. It would explain why the central nervous system suffers and the peripheral nerves escape. It is in harmony with the neuroglial proliferation, more marked in the grey matter where the poison is brought into closer contact with the tissues, less marked but still evident in the white matter where the capillary blood-supply is poorer and where the neuroglial substance is broken up by columns of well-myelinated nerve fibres. If we adopt the view that the poison has this

affinity for the neuroglia and exerts it from the blood stream we may well regard the perivascular and meningeal infiltration as evidence of a protective process, successful to a great extent in the white matter but unable always to cope with the accumulation of toxic forces in the vascular grey matter. Whether it is justifiable or not to assume a particular relationship between the poison of acute poliomyelitis and the neuroglial tissue of the central nervous system, it is clear that in some way the destruction of the ganglion cells is the result of the inflammation of the interstitial substance and not due entirely to toxic influences.

Is the infection of the nervous system hæmatogenous or lymphogenous? The most striking evidence in favour of the hæmatogenous infection is afforded to my mind by the experiments of Hoche to which I have already referred. In one of his illustrations you will see that the general appearances of the section of the cord are similar to those of acute poliomyelitis, if we exclude the extensive necrosis of the white as well as grey matter produced by the blockage of the vessels, and we know that in this case the poisonous material was introduced through the blood stream. Moreover, the finer histological details as described by Hoche in his paper bear a strong resemblance to those of the disease we are considering.

Wickman is the chief supporter of the lymphogenous origin of the infection in poliomyelitis and he certainly urges the claim on strong grounds. The inflammation in the meninges and perivascular lymph channels and the not infrequent spread of the disease in an upward direction are points in its favour, but he has not given us any clear evidence of infection of the central canal in the cases he has examined. The same author has drawn attention to the general resemblance of the morbid processes in the central nervous system to those found in rabies either of man or the lower animals. If one examines the drawings made by Sir William Gowers for the Transactions of the Pathological Society in 1877, representing the changes in the medulla in four cases of hydrophobia which he had examined, one finds a picture which would do well for what other observers, as well as myself, have found in fatal cases of poliomyelitis. There are the same distension of blood-vessels and the same infiltration of perivascular lymph spaces with cells which are regarded as leucocytes; there are, too, the foci of round cells in the bulbar nuclei and in the formatio reticularis. Gowers mentions that similar changes are present in the spinal cord in some cases, and later writers have regarded the inflammatory condition of the latter as characteristic of rabies, whether it is accidental or experimental in origin. They have described the perivascular infiltration in the white as well as the grey matter, the foci of normal cells in the cornua, the serous exudation around vessels, and the various degrees of degeneration in the ganglion cells. Schaffer believes that the greatest intensity of pathological change was present in that part of the cord which innervated the region of the source of infection, but this is not confirmed by Babes. Wickman has reproduced a drawing from the monograph of Hogyes showing under low magnification the general appearance of the sacral cord of a child who had been bitten and infected in the thigh, and uses it as additional evidence in favour of the lymphogenous origin of poliomyelitis. The anatomical similarity between rabies and poliomyelitis is rendered still more interesting by the fact that the paralytic form of rabies, which is by no means uncommon, may present clinical features indistinguishable from those of acute poliomyelitis. The well-known case published by Bristowe and Horsley of hydrophobia resembling clinically an acute ascending paralysis showed a morbid anatomy which would readily pass for an acute poliomyelitis (although not for a Landry's paralysis), and the distinction was only confirmed by the fact that rabies was reproduced in animals by inoculation from the cord of the patient. However interesting the points of similarity between rabies and poliomyelitis may be, their use as evidence of the lymphogenous origin of the latter must be delayed until the former has been definitely shown to result from that mode of infection.

Against the view that the cord in poliomyelitis is infected through the lymphatics of the peripheral nerves must be ranged the experiments of Homen to which I referred in my first lecture. It was shown there (1) that the entry of organisms and toxins into the spinal cord was effected chiefly along the various septa within the lymph channels of the radial vessels and along the anterior, and more especially the posterior, roots; (2) that within the spinal cord and its membrane the infection was carried upwards mainly between the meninges and along the central canal; and (3) that the changes within the cord were somewhat patchy and irregular, affecting the grey and white matter alike and especially the region of the posterior median septum. These facts do not tally with the lesions of poliomyelitis and have much more in common with those of ascending myelitis.

Before passing on to my final conclusions I must say a word or two with regard to the specificity of acute poliomyelitis. No dogmatic statement can be made on this point with the bacteriology of the disease in its present extremely incomplete and unsatisfactory position; but the epidemic phases of the disease and the lack of success which has attended efforts to produce experimentally, with the ordinary pathogenic organisms, any condition comparable to that of poliomyelitis are two important points in favour of the view that it is a specific disease. The argument that it frequently follows measles, scarlet fever, influenza, and other specific fevers cannot outweigh the other facts or, indeed, be regarded very seriously. There are plenty of instances of acute specific fever following quickly on the heels of another without any suggestion forthcoming that the latter condition is a result of the earlier one.

I cannot help feeling strongly that acute poliomyelitis will, before many years have passed, be included in the category of the specific fevers. It has the constitutional disturbances, the age incidence, the seasonal exacerbations, the sporadic and epidemic types, the immunity from second attacks, associated with the obscurity as to its bacterial origin, which are shown by measles, scarlet fever, and others, and the severe inflammatory lesions limited to particular tissues which are met with in typhoid fever, diphtheria, and variola, as well as other members of the same category.

The following conclusions appear to me justifiable concerning the disease:—1. It is an acute specific fever occurring sporadically and epidemically, differing from many others but resembling some—variola, for instance—in the facts that its lesions may be discrete or confluent and that its results may be permanent. 2. Its essential lesion is an inflammation of the interstitial tissue of the central nervous system due to the presence of micro-organisms or their toxins probably in the blood (but possibly in the lymph) circulating within that system. 3. The fact that the grey matter suffers more than the white matter is explained by the greater vascularity of the former and the resistant character of the component parts of the latter. 4. The same morbid process underlies some cases of encephalitis both of the brain stem and the cerebrum, among which may probably be included many examples of infantile hemiplegia. 5. The bacteriology is at the present time practically an unknown quantity. Bacteriological investigation of the blood as well as of the cerebro-spinal fluid is indicated, and more complete examination of other organs, especially of the intestines.

UNIVERSITY OF LONDON.—An election to the Senate of the University of London took place on March 19th. There were two ballots; at the first 243 voted, the figures being 114 for Dr. L. E. Hill, 104 for Dr. J. R. Bradford, 102 for Dr. J. Kingston Fowler, 95 for Dr. H. A. Caley, and 48 for Dr. Norman Moore. Dr. Norman Moore did not proceed to the second ballot, when 227 voted, and the figures were found to be 126 for Dr. Hill, 125 for Dr. Caley, 100 for Dr. Bradford, and 99 for Dr. Fowler. Dr. Hill and Dr. Caley were therefore declared to have been elected to the two vacancies on the Senate.

ROYAL FREE HOSPITAL.—The Duchess of Albany, attended by Lady Evelyn Moreton and accompanied by Mrs. Harkness, visited the Royal Free Hospital, Gray's Inn-road, on the afternoon of March 15th, where she was received by Dr. Harrington Sainsbury, the senior physician; Mr. Conrad Thies, the secretary; and Miss Cox-Davies, the matron. Her Royal Highness visited the wards, nurses' quarters, and various departments of the hospital and expressed her great satisfaction at the many structural and other improvements recently carried out and her approval of the proposed erection of two new operating theatres which are urgently needed to meet the greatly increased surgical work of the hospital. Before leaving Her Royal Highness signed the visitors' book and partook of tea in the matron's sitting-room.

The Hunterian Lectures

ON

THE RENAL FUNCTION IN ITS RELATION TO SURGERY.

Delivered before the Royal College of Surgeons of England,

BY J. W. THOMSON WALKER, M.B., C.M. EDIN., F.R.C.S. ENG.,

HUNTERIAN PROFESSOR OF SURGERY, ROYAL COLLEGE OF SURGEONS OF ENGLAND; ASSISTANT SURGEON TO THE NORTH-WEST LONDON HOSPITAL AND TO ST. PETER'S HOSPITAL FOR STONE.

LECTURE II.[1]

Delivered on March 4th, 1907.

THE ESTIMATION OF THE FUNCTION OF ONE KIDNEY.

MR. PRESIDENT AND GENTLEMEN,—In my first lecture I endeavoured to show what means had been adopted to ascertain the value of the combined function of the kidneys. I shall now pass to the consideration of the methods at the disposal of the surgeon in estimating the function of one kidney. When one kidney is diseased and it is accepted that its function is seriously impaired or totally destroyed the question of prognosis and the decision in regard to surgical interference and its extent will in a considerable majority of cases depend upon the view which the surgeon takes in regard to the functional activity of the second kidney. I shall briefly review the methods upon which until a recent date the surgeon relied for the data on which to base his judgment in this matter.

Where one kidney is obviously diseased the patient may show symptoms of failure of the renal function and thus betray the reduced activity of the second kidney. With these symptoms before him the surgeon will be able to decide whether he will take the risk of advising surgical interference and how far this may be carried. But it is in the case where general symptoms of renal failure are absent that more information is desired in regard to the functional power of the second kidney. The surgeon has hitherto had to depend upon the presence of local signs of disease of the second kidney, upon his experience of the pathology of such diseases, and lastly upon statistics. There may be enlargement, pain, and tenderness of the organ, but these do not give unquestionable proof that the kidney is seriously diseased. The x rays may give valuable aid in some cases of calculous disease. Extensive shadows in the second kidney may indicate that the margin of renal tissue is too small to maintain the function, or, on the other hand, the absence of shadows will show that calculi are not present in the second kidney.

But these form only a small number of the cases that are presented for consideration. The real difficulty arises when there are no general symptoms of renal failure and there are no local signs of disease of the second kidney. It cannot be said in such a case that the absence of signs of disease are a proof of the health of the second kidney, for experience has abundantly shown this to be erroneous.

The statistics which have been compiled with regard to the bilateral incidence of various renal disorders may be used in this service. Some of these are seen in the following list:—

Statistics of Solitary Kidneys and Bilateral Renal Disease.

Solitary kidneys (one kidney atrophied)	6 in 15,904, 1 in 2650 (Morris).
Small, shrunken, or wasted ...	59 in 8178, 1 in 138 (Morris).
Malignant growths, bilateral ...	12 in 118, 1 in 10 (Kelynack).
Polycystic kidney, bilateral ...	150 in 191 (Küster, collected). 25 in 26 (Dickinson, collected). 65 in 66 (Lejars, collected). 4 in 4 (Israel). 3 in 7 (Morris).
Calculus, bilateral	38 in 76, 50 per cent. (Legueu). 90 in 764, 11·78 per cent. (Küster). 21 in 83, 25·3 per cent. (Torrés).
Pyelonephritis, bilateral	59 in 71, 83 per cent. (Weir).
Tuberculous disease, bilateral ...	43 in 81, 53 per cent. (Heilberg and Oppenheim). 106 in 205, 51 per cent. (Pulet).

[1] Lecture I. was published in THE LANCET of March 16th, 1907, p. 711.

Statistics have, however, only a limited value. It will be seen by referring to the figures quoted above that renal growths are unilateral in over 89 per cent. of published cases. This percentage is therefore accepted as a guarantee that in removing a kidney containing a renal growth little or no risk is run of the patient having submitted to a useless operation from the presence of a second tumour in the remaining kidney. Again, it is known that the ratio of solitary kidneys is 1 in 2650 cases and that a kidney may be removed with but small chance of the patient being dead from uræmia in a few days from the removal of his entire urine secreting apparatus. Apart from such unusual cases, however, there is a large number of patients who suffer from some renal disease which is notoriously bilateral in its later stages. These cases include certain forms of renal calculus, tuberculous disease, and suppurative diseases of the kidney. In operating upon the obviously diseased kidney in such conditions and especially in proposing removal of the organ a certain risk is undertaken.

I have collected from the literature 75 cases of operation upon one kidney where uræmia or anuria commenced within the first few days after operation. Of these 26 (34·6 per cent.) were calculous, 17 (22·6 per cent.) tuberculous, and other suppurative conditions were present in 13 (17·3 per cent.). Nephrotomy was performed in 27 cases and nephrectomy in 48. There was no second kidney in five. The second kidney was atrophied in seven, the seat of nephritis or degeneration in 18, calculus in 12, pyo- and hydronephrosis in nine, tuberculosis in six, and new growth in two. It is certain that in some of these cases operation would not have been performed had the state of the second kidney been known.

CYSTOSCOPIC EXAMINATION OF THE URETERAL OPENINGS.

The discharge of urine or other material from the ureteric orifice might be expected to give valuable assistance in the investigation of renal disease, and this is the case where the localisation or diagnosis of an obscure disease is the subject of inquiry. But when the diagnosis is already made and the sole object of investigation is to measure the functional activity of the kidney the information gained by the examination is frequently disappointing.

The absence of a periodic discharge of urine does not signify that no kidney is present or that the functional power of the kidney is destroyed. It not infrequently happens that no discharge of urine is observed for a considerable time when there is every reason to believe that the kidney is healthy. Such periods of functional inactivity are the result of nervous influences. Where one kidney is absent it does not of necessity follow that the ureteral opening is also absent. In a case recorded by Jolly[2] the right kidney was absent. On the right side of the trigone there was a ureteral opening into which a probe could be passed for 1 centimetre and beyond that there was a fibrous band 13 centimetres long. Usually, however, when one kidney is congenitally absent there is no ureteral opening on that side. The remaining ureter may be normal in position or it may be displaced. In 18 cases where one kidney was absent the corresponding ureter was also absent in 12, and it was specifically stated that the ureteral orifice was absent in four of these.[3] It will sometimes happen from various causes that there is a difficulty in finding one ureteric orifice in cases where both kidneys are present.

A copious efflux is not a guarantee that the function of the kidney is healthy. The polyuria of advanced interstitial nephritis and of waxy disease may be observed on the side of the second kidney in renal surgery. A purulent or bloody urine is no measure of the renal function, however important it may be in diagnosis. I have never seen a "solid efflux" of blood and débris such as Mr. E. Hurry Fenwick describes,[4] but I have met with a case of hæmaturia in which an irregular greyish spongy-looking clot projected from the left ureter (Fig. 14). The renal function was not seriously impaired. It is a different matter when a worm of semi-solid waxy pus is slowly expressed at intervals from a reddened ureter (Fig. 15). I have notes of two such cases. There had been symptoms of renal trouble for eight and 11 years respectively and in each case the kidney was a large thick-walled pyonephrosis containing much semi-solid pus,

[2] Soc. Anat. de Paris, Jan. 9th, 1896.

[3] In these cases the genital system was either normal or no abnormality was mentioned in 15. There was general malformation of the external genital organs in one case and abnormality on the same side as the absent kidney in two.

[4] Ureteric Meatoscopy in Obscure Diseases of the Kidneys, 1903.

débris, and calculi. This form of ureteric discharge is significant of a functionless kidney.

I have met with four examples of a condition which Mr. Fenwick has described as the "dragged out" ureteric orifice.

FIG. 14.

Ragged greyish blood clot projecting from left ureter after severe renal hæmaturia.

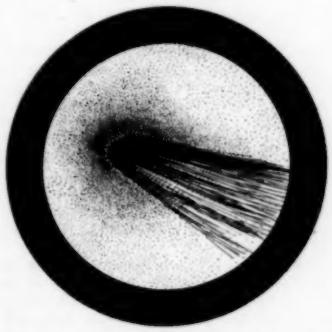
Of the condition this observer says: "It affords the most conclusive *cystoscopic* evidence that we possess of the partial destruction of a small, often unfeelable, kidney by tuberculosis." The orifice is displaced upwards and outwards and

FIG. 15.

Mass of semi-solid pus expressed at intervals from left ureter. Case of left pyonephrosis.

lies in the depth of a tunnel-like depression. In the four cases that came under my observation there was advanced tuberculous disease of the kidney in all. In one case the hypertrophied inter-ureteric bar which formed a ridge running along the floor of the tunnel was dragged in and out at

FIG. 16.



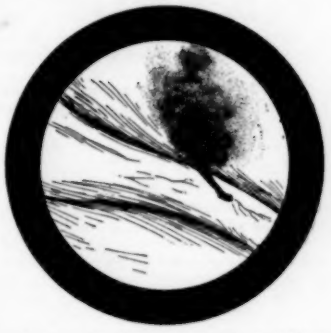
"Dragged out" ureter in case of renal tuberculosis.

each respiratory movement almost like a piston; in another no respiratory movement took place but pressure on the kidney caused a violent tug at this ridge of muscle.

CHROMOCYSTOSCOPY.

A method of cystoscopic estimation of the renal function has been suggested by Vallicher and Joseph.[5] An intramuscular injection of four cubic centimetres of a 4 per cent. solution of indigo carmine is made. Elimination commences in 20 minutes, reaches its height 30 minutes later, and has ceased in two hours. The authors claim that the examination of the ureteral openings and the observation of variations in the depth of staining of the urines during the elimination will afford an approximate idea of the functional value of the two kidneys (Fig. 17). Similar observations had previously been made with methylene blue. This method is preferred by some (Hartmann, Legueu) to the results of ureteral catheterisation. The two methods do not, however, lend themselves to comparison. Differences in the depth of staining of the urine of each kidney can be observed by either method,

FIG. 17.



Chromocystoscopy. The left ureter is shown at the moment when a jet of urine stained with indigo-carmine is being expelled.

but much more accurately in collected separate urines than by watching the momentary jet from the ureteral orifice. But in addition to this the chemical and microscopical analysis of the separated urines gives invaluable information that cannot be obtained by chromocystoscopy. At the best it is a ready clinical test of the presence or absence of a ureteral efflux and from the opacity of the jet some idea may be gained of the function of the kidney. As a means of localising the position of the ureters in difficult cases and of making observations on the renal secretion where catheterisation of the ureters or separation of the urines is impossible it may play a minor rôle.

METHODS OF OBTAINING THE URINE OF EACH KIDNEY SEPARATELY.

It has been the ambition of surgeons almost since the date of the first nephrectomy to obtain the urine of each kidney separately for examination. Dr. Tuchmann[6] perfected his apparatus five years after Simon's nephrectomy and other methods were published in rapid succession. So far as the earlier attempts were concerned the chief source of interest was the localisation of disease to one or other kidney. Other means have been introduced and perfected which have to some extent, although not entirely, replaced this use of the separation of urines, and its chief sphere of usefulness at the present time is the examination of the urines in order to estimate the function of these organs.

It is beyond the scope of these lectures to trace the evolution of the methods of separation of the urine from each kidney, nor shall I discuss the technique or dwell upon the arguments for or against this method of investigation. We are concerned here with the results obtained by different methods of testing the renal function.

THE EXAMINATION OF THE URINES OF THE TWO KIDNEYS.

The cumulative evidence of many series of careful examinations have provided a quantitative average for the combined output of the two kidneys. With the separation of the urine into the output of each kidney the necessity for a new standard for comparison arose. It was not sufficient to divide the total output by

[5] Münchener Medicinische Wochenschrift, 1903, p. 2028, and Deutsche Medicinische Wochenschrift, 1904, p. 536.

[6] Wiener Medicinische Wochenschrift, 1874, pp. 21-22.

two in order to indicate the work of one kidney, for Landois, Hermann, Ludwig, and others have shown the unequal physiological value of the kidneys at a given time in animals.

For reasons that I shall presently relate the urine of the second kidney, when one is diseased, cannot always be used as a normal standard with which to compare the work of the diseased organ. An independent normal standard must therefore be set up to show the average normal output of one kidney. This standard has been provided by the work of Albarran.[7] According to this observer no regular alternation is observed in the work of the two kidneys, but when the secretion of each kidney is collected during six or 12 hours it is found that each has performed nearly the same work. One may consider as practically healthy a kidney which secretes a urine like the following in 24 hours:—

Quantity	600 to 700 cubic centimetres.
Urea	12 to 15 grammes.
Chlorides	5 to 6 "
Δ	− 1·30° to − 1·50° C.

If the time during which the urine is collected is only two or three hours the figures are less reliable. It is then necessary to study the urine at a time when digestion is not going on and when the individual has not drunk anything for several hours.

Albarran gives the following as an analysis of urine collected from one kidney during one hour under these conditions when both kidneys are healthy:—

Quantity	50 to 60 cubic centimetres.
Δ	− 1·20° to − 1·50° C.
Urea	12 to 17 grammes per litre.
NaCl	10 to 12 " "

In comparing the function of two healthy kidneys this observer found that when the comparison was made of urine collected during so short a time as a quarter of an hour the difference amounted to as much as from 10 to 30 per cent. in the quantity of urine secreted, but when the examination was extended to one hour the difference was reduced to 10 per cent. The difference in the quantity of urea might be one gramme per litre or might amount to 6·50 grammes. The difference in the quantity of chlorides amounted to 50 centigrammes per litre and might attain five grammes. The diseased kidney usually secretes less urine than its healthy or less diseased neighbour. This will in some manner depend upon the form and extent of the disease. A hydronephrotic kidney will pass no urine through the catheter or only a very small quantity during the period of its retention. A pyonephrosis or an extensive pyelonephritis will produce a much reduced quantity. This reduced activity may be thrown into stronger relief by the secretion of an increased quantity of urine by the healthy organ and an erroneous idea of the extent of the disease may be gained by observing the inequality of secretion in such a case. The polyuria may result from passing causes or it may result from compensatory hypertrophy.

But there are frequent exceptions to this statement. The two urines may be practically equal in quantity where one kidney is diseased. Further, as Albarran has pointed out, there may be an exaggerated activity on the part of the diseased organ so that a polyuria may be observed on this side. There may be at the same time an excessive elimination of urinary salts. The urine of the diseased side is often lacking in pigment. This may be observed when the quantity of urine does not show a very great difference from that of the healthy kidney; it is more striking where the quantity of urine is excessive on the diseased side. There is usually a diminution in the quantity of urea, chlorides, and phosphates contained in the urine of the diseased side, and this is greater when the disease is more advanced. The following analysis of the urines from a case of calculous pyonephrosis illustrates this and other points to which I shall refer later.

	Right kidney (diseased).		Left kidney.
Quantity	206·5 c.c.	...	107·5 c.c.
Specific gravity	1004	...	1011
Δ	−0·18° C.	...	−0·76° C.
Colour	Pale limpid.	...	Fairly coloured.
Urea	0·4 per cent.	...	1·3 per cent.
Uric acid	0·0067 "	...	0·0150 "
Chlorides as chlorine ...	0·09777 "	...	0·1112 "
Phosphates as P_2O_5 ...	0·08 "	...	0·034 "
Methylene blue	No change in colour.	...	Appeared 1 hour 50 minutes, green colour, duration 18 hours.
Chromogen appeared ...	25 minutes, faint green.	...	25 minutes, deep green.
Phloridzin glycosuria ...	0·395 grammes.	...	1·623 grammes.

[7] Exploration des Fonctions Rénales, 1905.

CRYOSCOPY OF THE TWO URINES.

Changes in the freezing point of the two urines are dependent upon a proportional increase or decrease of the molecular composition of the urine. In order to make observations of any value upon the cryoscopy of the urines a knowledge of the comparative volumes of the urines is necessary. Just as in estimating the total function of the kidneys the volume of urine and its molecular composition change under varying conditions during the day and night, so the composition of the single kidney urine will change, and an attempt to estimate the functional value of one kidney must be subject to similar restrictions. Thus it is necessary to collect the urines by catheters during 24 hours and to examine the mixed specimen, and, further, the observations should be repeated on several successive days. It is evident that such a method of examination is impracticable, so that observations must be made, if cryoscopy is to be used, upon a urine secreted during a much shorter period of time (two or three hours). The variations in healthy individuals, even with a careful control of the solid and fluid intake, are very considerable, and it appears to me to be doubtful whether any trustworthy data in regard to the function of one kidney can be obtained by this method.

Comparative cryoscopy of the two urines will, however, give some information in regard to the difference of function between the kidneys and, if it can be ascertained that one of them is healthy, this may act as a standard for comparison for the other. It must be remembered, however, that the function of the healthy kidney is likely to be depressed from the presence of its diseased neighbour. Usually there is a diminished quantity of urine with a reduced molecular content on the diseased side; occasionally there may be a polyuria with a proportionally greater reduction of molecules. The presence of polyuria or the reverse is not a measure of the functional activity of the kidney, and even where the quantity of urine is included in the formula the large variations are likely to prove a fallacy in the result of the calculation. It is important, also, to note that the healthy or almost healthy kidney may produce an increased quantity of urine. The result may be affected by these factors, so that even when the freezing point, corrected for volume, of the two sides is compared higher figures may be obtained on the diseased side.

When the volume of urine of one kidney is greater and the freezing point shows at the same time a greater molecular content this kidney is functionally more active than its neighbour.

In the lesser degrees of renal disease the cryoscopy figures are not usually altered, but where disease has destroyed a large part of a kidney there is usually a marked difference between the freezing points of the two urines. The variations in the point Δ of the two urines do not follow closely those of the quantity of urea, sodium chloride, and phosphates.

METHYLENE BLUE TEST FOR EACH KIDNEY.

In using methylene blue for the estimation of the function of each kidney it is obviously inadvisable to make observations for the 60 or more hours during which the blue may be expected to be present in the normal state, much less is it expedient to attempt the drainage of each kidney during the protracted elimination that may occur in disease. The accompanying chart (Fig. 18) shows the elimination of blue and chromogen in a case of hydronephrosis.

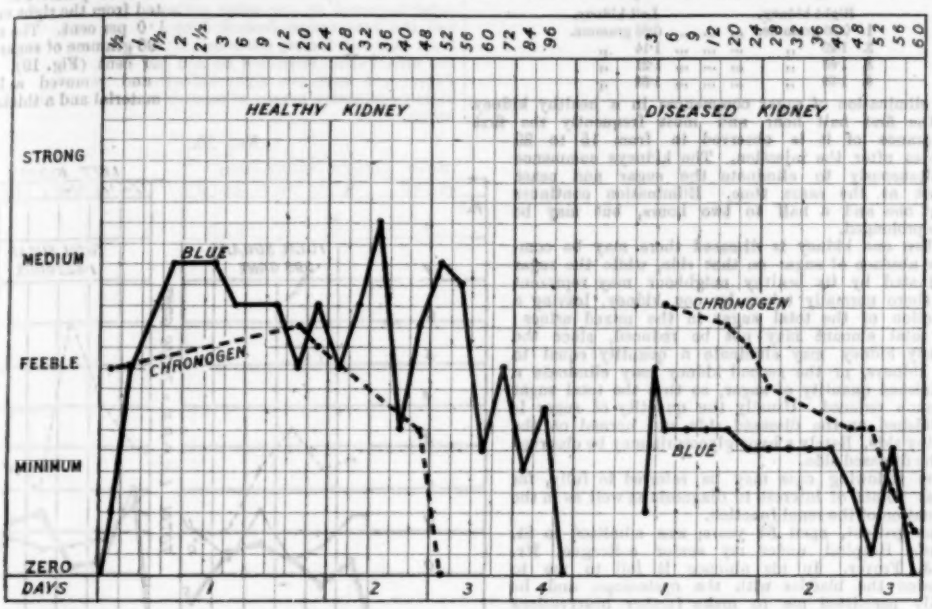
Two of the important points in the elimination of methylene blue by the kidneys may, however, be investigated with a comparatively short ureteral drainage. Observations may be made on the time of appearance of the blue and chromogen and the depth of staining of the secretion as a measure of the quantity of blue eliminated. For this purpose a catheterisation of an hour, or at most two hours, will suffice.

I have selected the following cases in illustration as they indicate the extent of the information that may be gained by this method and show how far the conclusions based upon it were justified.

CASE 1.—The patient was a man suffering from right-sided pyelitis of ten months' duration with an enlarged tender kidney. On the right (diseased) side methylene blue appeared in 60 minutes as a dirty green colouration and the microscope showed pus and renal cells and bacilli. The left ureter gave clear blue urine in 30 minutes which showed no deposit. After nephrotomy the symptoms subsided.

CASE 2.—The patient, aged 48 years, came under my observation at the North-West London Hospital. There was

FIG. 18.



Elimination of methylene blue and chromogen in a case of hydronephrosis. Delay and diminished quantity of blue and delay of chromogen on diseased side (Albarran).

a large, hard left kidney and the right kidney was not palpable or tender. The left (diseased) kidney excreted no methylene blue and no chromogen and the right urine was deeply stained with methylene blue and chromogen in 27 minutes. A large thin-walled pyonephrotic cyst containing masses of calculi was removed. The patient died with symptoms of septic absorption. The remaining kidney (right) was found to be healthy.

CASE 3.—In this case there was a large, hard, irregular calculous mass in the right kidney and the left kidney was not palpable or tender. There were no symptoms of renal failure except constant thirst. No blue or chromogens appeared in the urine from either kidney. Operation was refused and the patient died from suppression of urine 18 months later. The left kidney was also destroyed by calculi.

CASE 4.—This was another case of calculous pyonephrosis. The right (diseased) kidney passed no blue but a small amount of chromogen appeared. The left kidney passed chromogen in quantity in 25 minutes and blue in 1 hour 50 minutes. The right kidney was found on operation to contain large calculous masses with a thin covering of fibrous renal tissue. The patient made a good recovery.

An early onset of elimination and a good quantity of blue in the urine were accepted in my cases as a guarantee of the functional activity of the second kidney, whereas the absence of blue and chromogen in the urine of the second kidney was taken as an indication of an inefficient or destroyed kidney. Between the extremes of a well-marked blue elimination and its complete absence from the urine of the second kidney there are varying degrees of elimination. In making observations upon such cases the methylene blue method suffers from the disadvantage of a long duration. The drainage of each ureter by catheter during a period of two or three days is impracticable as a routine measure.

Except in such pronounced results as those which I have related the method does not provide sufficiently definite information on which to base conclusions as to the total function of one kidney. But as a means of comparing the work of the two kidneys in a given time it has an undoubted value. If the function of the combined kidneys is estimated at a high value and the separation of the urines shows that the blue is secreted with little delay on either side and in about equal quantity the active renal tissue is probably distributed pretty evenly between the two organs and is present in good quantity. If, on the other hand, the commencement of elimination is delayed and the total blue excreted is small in amount and by draining each kidney the proportion is found evenly distributed between the two, it would be inferred that a diminished amount of renal tissue was distributed equally between the two organs and for this reason nephrectomy might be contra indicated. When the difference between the two secretions is marked so that the supposed healthy kidney secretes much the greater quantity of methylene blue it will appear probable that the second kidney has already assumed a large part of the renal function and may be trusted to carry it on if the diseased organ is removed. This demonstration of the renal function will be the more striking if the diseased kidney eliminates no trace of blue or chromogen. On the other hand, it is certain that if the second kidney is the seat of latent disease which has hitherto passed unnoticed examination of the urine drawn by catheter from that ureter will give a clue to the presence of the disease which will be strengthened by the use of the methylene blue test. I have not observed as a frequent occurrence the intermittent elimination of methylene blue by the healthy second kidney which Albarran attributes to compensatory hypertrophy.

Before leaving this test an observation may be made in regard to the demonstration of the relief from the reno-renal reflex. In a case of pyonephrosis nephrotomy was performed on August 16th, 1906, and the injection of methylene blue failed to colour the urine or to appear in the discharge from the wound. Chromogen appeared in the urine in one and a quarter hours. Nephrectomy was performed on August 29th and the methylene blue test was again carried out. The dye now appeared as a deep green and the chromogen as a blue-green in the urine in one and a half hours and one hour respectively. The patient made a good recovery. (Fig. 9, Lecture I.)

PHLORIDZIN GLYCOSURIA TEST FOR EACH KIDNEY.

In healthy individuals the elimination of glucose by the two kidneys is equal and parallel. Variations in the work of the two organs occur, however, which may amount to from 10 to 20 per cent. I have observed a difference of 0·45 gramme between the amount eliminated by each kidney

(1 20 right and 1·65 left) in a healthy individual. Albarran gives the following results in four healthy individuals:—

	Right kidney.	Left kidney.
1.	0·86 gramme.	0·68 gramme.
2.	1·20 ,,	1·14 ,,
3.	1·66 ,,	1·21 ,,
4.	1·80 ,,	1·62 ,,

The elimination of sugar commences in a healthy kidney in the first half hour and most frequently the first appearance of it is observed in from 15 to 20 minutes after the injection. The kidneys commence simultaneously to eliminate the sugar and cease almost at the same time. Elimination continues about one and a half to two hours, but may be more prolonged.

When one kidney is diseased there may be complete absence of sugar on that side, while the sugar eliminated by its healthy neighbour may represent the share normally taken by one kidney, leaving a reduction of the total sugar in the mixed urines; the total amount may not be reduced, since the healthy kidney may eliminate a quantity equal to two kidneys, or the second kidney may eliminate a diminished quantity of sugar, so that the total sugar is much reduced. Usually the quantity of sugar is diminished on the diseased side and normal on the healthy side. Rarely a hyperglycosuria may be observed on the diseased side.

The following case may be referred to fully, for it has points of interest in diagnosis as well as in the estimation of the renal function.

The patient, aged 54 years, was admitted to St. Peter's Hospital under my senior colleague, Mr. P. J. Freyer. In his absence it fell to me to examine the bladder with the cystoscope and he kindly permitted me to make further observations upon the patient in regard to his renal function. There was a history of frequent micturition during the day and night for months and scalding during the act. There had been difficult micturition and a poor stream for six weeks but never hæmaturia. The kidneys were not tender or painful and neither kidney could be felt under deep anæsthesia. Tubercle bacilli were detected in the urine. Vesical spasm rendered cystoscopy difficult. The bladder showed general subacute cystitis; the opening of the right ureter was far out on the side wall of the bladder; a thickened interureteral bar led up and into a tunnel which represented the opening ("dragged-out" ureter). Palpation of the kidney on this side produced a powerful tug on this muscular ridge. I catheterised the right ureter, drained the bladder, and injected five milligrammes of phloridzin. No sugar appeared in the urine collected from the right ureter and the urea varied from 0·8 to 1·0 per cent. The urine from the left kidney contained 0·296 gramme of sugar and the urea varied from 2·4 to 2·6 per cent. (Fig. 19). Mr. Freyer cut upon the right kidney and removed a large kidney containing masses of caseous material and a thickened ureter.

FIG. 19.

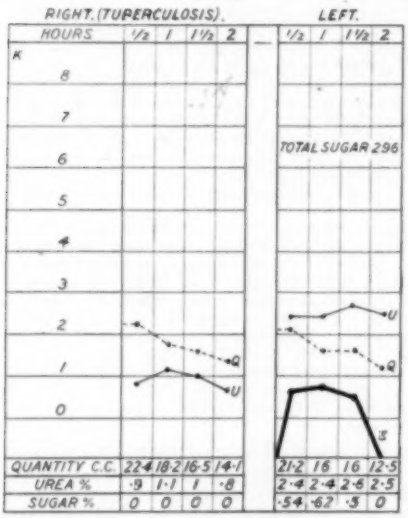
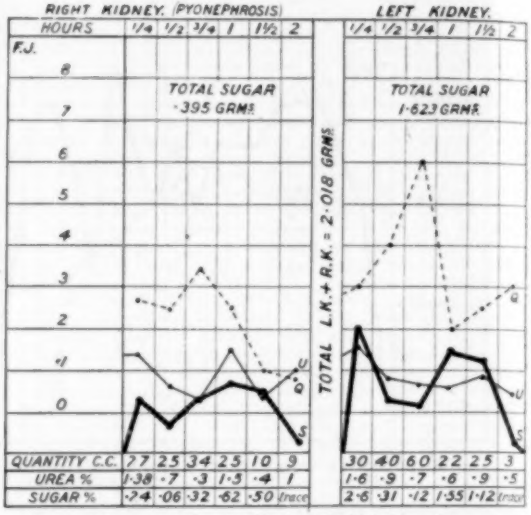

RIGHT. (TUBERCULOSIS).
LEFT.
HOURS
½ 1 1½ 2
TOTAL SUGAR 296
QUANTITY C.C. 22·4 18·2 16·5 14·1 21·2 16 16 12·5
UREA % ·9 1·1 1 ·8 2·4 2·4 2·6 2·5
SUGAR % 0 0 0 0 ·54 ·62 ·5 0

Chart of work of each kidney in case of advanced tuberculosis of right kidney. Absence of sugar on diseased side. Sugar indicated by thick continuous line, urea by thin continuous line, and quantity of urine by dotted line.

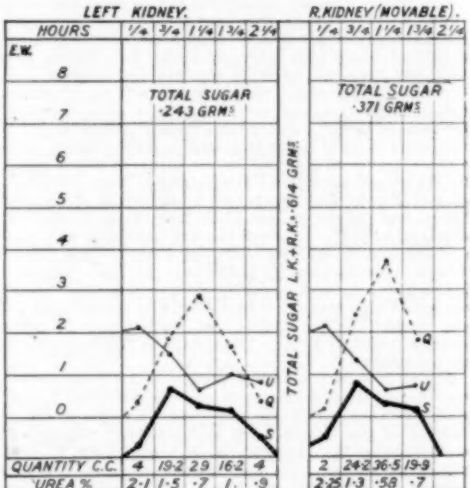
FIG. 20.


RIGHT KIDNEY. (PYONEPHROSIS)
LEFT KIDNEY.
HOURS
¼ ½ ¾ 1 1½ 2
TOTAL SUGAR ·395 GRMS.
TOTAL SUGAR 1·623 GRMS.
TOTAL L.K.+R.K. = 2·018 GRMS.
QUANTITY C.C. 77 25 34 25 10 9 30 40 60 22 25 3
UREA % 1·38 ·7 ·3 1·5 ·4 1 1·6 ·9 ·7 ·6 ·9 ·5
SUGAR % ·74 ·06 ·32 ·62 ·50 (trace) 2·6 ·31 ·12 1·55 1·12 (trace)

Large calculous pyonephrosis. Diminished elimination of sugar on diseased side.

Phloridzin failed to produce glycosuria on one side while it appeared in much reduced quantity on the other in two cases, where there was apparently insufficient cause. In one, a case of right-sided moveable kidney, the supposed healthy kidney eliminated no sugar while the moveable kidney produced only 0·037 gramme. In another, a very nervous man with attacks of left-sided renal colic and a history of hæmaturia, the painful kidney eliminated 0·46 gramme of sugar and the supposed healthy kidney none at all.

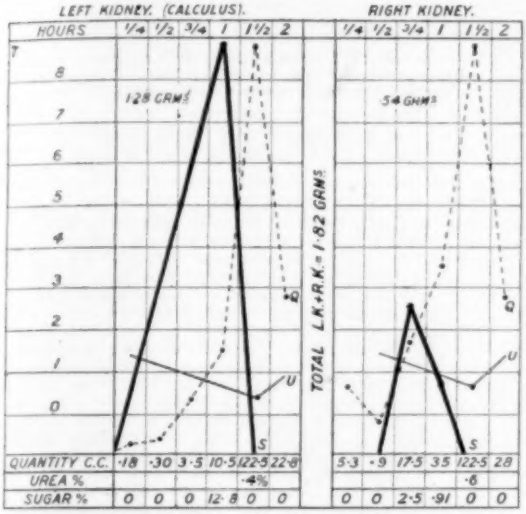
FIG. 21.


LEFT KIDNEY.
R. KIDNEY (MOVABLE).
HOURS
¼ ¾ 1¼ 1¾ 2¼
TOTAL SUGAR ·243 GRMS.
TOTAL SUGAR ·371 GRMS.
TOTAL SUGAR L.K.+R.K. = ·614 GRMS.
QUANTITY C.C. 4 19·2 29 16·2 4 2 24·2 36·5 19·9
UREA % 2·1 1·5 ·7 1. ·9 2·25 1·3 ·58 ·7
SUGAR % ·025 ·63 ·31 ·18 ·05 ·05 ·79 ·38 ·20

Case of moveable kidney. Elimination of sugar greater on diseased side.

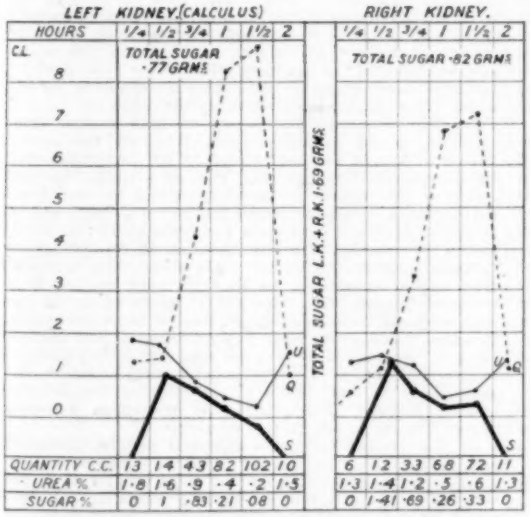
The quantity of sugar eliminated on the diseased side was diminished while that from the healthy kidney was normal in a case of pyonephrosis containing large masses of calculi (0·395 gramme and 1·623 gramme) (Fig. 20). On the other hand, the elimination on the diseased side in a case of moveable kidney was greater than that on the healthy side (Fig. 21), and in a case of stone in the renal pelvis there was a striking increase in the percentage of sugar in the urine on the diseased side over that present on the healthy side (Fig. 22). In another case of renal pelvic calculus of small size the elimination of sugar on the two sides was practically equal (Fig. 23).

FIG. 22.


LEFT KIDNEY. (CALCULUS).
RIGHT KIDNEY.
HOURS
1/4 1/2 3/4 1 1½ 2
128 GRMS
54 GRMS
TOTAL L.K.+R.K. = 1·82 GRMS
QUANTITY C.C. ·18 ·30 3·5 10·5 22·5 22·8
5·3 ·9 17·5 35 122·5 28
UREA % ·4% ·6
SUGAR % 0 0 0 12·8 0 0
0 0 2·5 ·91 0 0

Calculus in left renal pelvis. Normal glycosuria. Percentage of sugar excessive on diseased side.

FIG. 23.


LEFT KIDNEY (CALCULUS)
RIGHT KIDNEY.
HOURS
1/4 1/2 3/4 1 1½ 2
TOTAL SUGAR ·77 GRMS
TOTAL SUGAR ·82 GRMS
TOTAL SUGAR L.K.+R.K. 1·59 GRMS
QUANTITY C.C. 13 14 43 82 102 10
6 12 33 68 72 11
UREA % 1·8 1·6 ·9 ·4 ·2 1·5
1·3 1·4 1·2 ·5 ·6 1·3
SUGAR % 0 1 ·83 ·21 ·08 0
0 1·41 ·69 ·26 ·33 0

Calculus of left renal pelvis. Elimination of sugar practically equal on two sides.

Where sugar is eliminated at all by a diseased kidney the commencement of the glycosuria is frequently delayed beyond half an hour. It is usual when a diminished quantity of sugar is eliminated by a kidney for the glycosuria to last for a shorter period of time. Frequently it is over in a quarter of an hour, sometimes in half an hour.

Clinical value of the test.—As a means of demonstrating the diseased side the phloridzin test is frequently more delicate than other methods. The fallacies which attend its use have already been noted. It must detract from the value of the test that cases have been observed when a diseased kidney eliminated a full quantity of sugar and a healthy (or supposed healthy) kidney passed none at all. A disadvantage of the phloridzin method is that it is very sensitive to slight changes in the kidneys and an exaggerated idea of the extent of the disease may be obtained by studying the glycosuria produced. Larger doses than those in use are more accurate, for there is less probability of a total absence of the glycosuria in slight lesions (Albarran). The cases in which these fallacies occur are exceptional and in the majority of cases in which I have used this method the result has proved reliable when tested by other methods or by operation. The short duration of the glycosuria is an undoubted advantage where the comparative work of the kidneys is in question. I have seldom required to prolong the examination beyond two hours in order to complete the phloridzin test. Where the phloridzin test is combined with an artificial polyuria it forms, I believe, a valuable method of estimating the function of each kidney.

Albarran's experimental polyuria test.—Albarran has established two general rules:—1. A diseased kidney has a much more uniform function than a healthy kidney and its function varies less from one moment to another the more its parenchyma is destroyed. 2. When one kidney alone is diseased or is the more diseased of the two, if the urinary function becomes disturbed it modifies its function less than the other, and the difference between the two glands is especially exaggerated by the variations in the function of the healthy kidney. If instead of examining comparatively the total quantity of urine secreted by each kidney during a certain space of time a series of fractions of the same time are compared, the course of the function of each kidney may be studied. Curves may thus be constructed for comparison of the work of the kidneys, and according to Albarran the differences between the two kidneys may be accentuated in making them perform during the examination a supplementary labour, such as the elimination of water or of phloridzin glucose. Albarran estimates the quantity of urine, the point Δ and Δ V, urea per litre and in centigrammes, the sugar per litre and in centigrammes. In the normal state the curves of the two urines follow each other and present similar variations (see Fig. 21). In pathological conditions the differences in the curves of each gland are readily observed. The sound kidney should show a reaction after drinking Evian water (Fig. 20). The curve of the quantity of urine should be elevated at the same time that the Δ is lowered and the urea and chlorides per litre are diminished. These oscillations should be evident and affect several divisions. One may consider satisfactory the elimination, by one kidney in an adult man, of from 1·20 grammes to 1·80 grammes of urea during the two hours of the test. Below 75 centigrammes to one gramme may be regarded as a faulty excretion. The Δ V presents as great variation as the quantity of urea. In a man one may look upon from 12,000 to 17,000 as good, from 8000 to 10,000 as mediocre, and 6000 and below as an impaired excretion.

FALLACIES OF METHODS OF ASCERTAINING THE RENAL FUNCTION.

Throughout these tests there run some fallacies that lie beyond the question of a perfect or imperfect technic. One factor is the partial activity of the kidneys in health. The renal function is not in full action at any one time under ordinary conditions. If proof is wanted of this it is to be found in the fact that if the urines of the two kidneys are collected separately and compared it will be found that one kidney is working more actively than the other, while at another time the kidney, which was less active, is now working with greater energy, yet over a sufficiently long

period the work of the two will be approximately equal. The renal output under any ordinary conditions does not therefore correspond to the full potential function of the kidneys and the activity will increase where greater demands are made upon it. What the safety margin of renal tissue may be, apart from hypertrophic changes, it is difficult to say. Certain it is, from the removal of mechanically injured kidneys in the human being where no opportunity for hypertrophy of the second kidney has occurred that the safety margin amounts to half of the total renal tissue.

Mr. Henry Morris records a case [8] which has an important bearing upon this subject. In a woman, aged 20 years, whose right kidney had been removed by another surgeon for tuberculous disease four years previously, he excised a tuberculous nodule involving about one-third of the left kidney. Seven years later this remaining portion of the kidney was explored and a quantity of pus was evacuated. The patient died four and a half months later from acute tuberculosis of the lungs. "Only two-thirds of one kidney existed and this remaining piece was very extensively fibrosed, so that the actual amount of secreting tissue must have been very small indeed." It appears, therefore, that the amount of renal tissue necessary for the secretion of an adequate quantity of urine is less than half the total quantity. The experiments of Dr. J. Rose Bradford [9] on animals have shown that two-thirds of the total kidney tissue may be removed and the animal remain in good health, but if the quantity of kidney tissue be reduced to one-quarter death occurs after an interval. It is this margin of safety that introduces a fallacy into the methods of estimating the renal function. A kidney disease may operate within this and give no sign of its incursions upon the potential renal function until an operation such as nephrectomy reveals the fact that the patient has been living upon the minimum of kidney tissue and even a very slight reduction of this or a temporary interference with its action is sufficient to overturn the balance and to produce suppression of urine.

Although it is apparently beyond the range of practical surgery at the present time to estimate the potential renal activity, yet some approach to it might, I think, be made by the coincident use of diuretic drugs with the artificial means of estimating the renal function.

Further, we cannot foretell how far hypertrophy will compensate for the reduction of kidney tissue. Tuffier [10] has studied this question by experiments on animals and concludes that compensatory hypertrophy only takes place when the kidney is partly or wholly normal. If it is the seat of parenchymatous nephritis the hypertrophy fails. According to this observer the quantity of renal parenchyma necessary for life is equal to about a quarter of the weight of the entire kidney tissue. A portion of kidney tissue equal to this weight suffices to reconstruct (by compensatory hypertrophy) a quantity of parenchyma equal in weight to one entire kidney.

Another factor is the difficulty in distinguishing between temporary functional depression and permanent reduction of function. To take an example, the obstruction of an enlarged prostate causes a reduced renal function that is partly temporary and partly permanent, the former being due to existing obstruction and the latter to interstitial changes in the kidney brought about by the obstruction. The removal of the obstruction will in such a case be followed by improvement in the renal function which it is impossible to measure beforehand. Yet upon this improvement the progress of the patient may depend after he has survived the removal of the obstruction.

Again, in the case of kidney disease the function of the second kidney may suffer depression partly from changes in its substance and partly, or perhaps wholly, from the reflex influences passing from its diseased neighbour. The removal of the diseased kidney or the source of irritation in it may be followed by a striking improvement in the function of a healthy or slightly diseased second kidney.

In these lectures I have endeavoured, in however hurried and imperfect a manner, to place before you some of the methods which are now within the reach of the surgeon in attempting to estimate the function of the kidney in surgical diseases of these organs. And at the outset I pointed out the limits which might be set upon the estimation of the renal function. It is no part of this work to suggest that the presence of renal disease should form a barrier to operation upon the lower urinary tract nor to surgical interference in the kidneys. The estimation of the renal function in surgical diseases has for its object the recognition of these cases which are hopeless from the permanent inadequacy of the renal function and their exclusion from operation.

In conclusion I would tender to the Council of the College my grateful thanks for the honour which it has conferred upon me in selecting me to deliver these lectures, thus enabling me to participate in the annual festival by which the College commemorates the name of John Hunter.

[8] Archives of the Middlesex Hospital, vol. vi., p. 1.
[9] Proceedings of the Royal Society, London, 1892.
[10] Études Expérimentales sur la Chirurgie du Rein, Paris, 1889.

CARCINOMA MAMMÆ IN THE MOUSE.*

BY E. F. BASHFORD, M.D. EDIN.,
GENERAL SUPERINTENDENT OF RESEARCH AND DIRECTOR OF THE LABORATORY OF THE IMPERIAL CANCER RESEARCH FUND;
AND
J. A. MURRAY, M.B., B.SC. EDIN.,
ASSISTANT, IMPERIAL CANCER RESEARCH FUND.

FROM the outset of the investigations of the Imperial Cancer Research Fund, in October, 1902, every effort has been made to give effect to the desire of the executive committee to develop the experimental aspects of the study of cancer. In directing the attention of other investigators to the experimental study of cancer we pointed out that, in the first place, it was essential to be sure we were dealing with malignant new growths comparable to those of the human subject.[1] We have carefully satisfied ourselves of the carcinomatous nature of the growths on which our experimental observations have been based, but have purposely avoided burdening our papers with details of descriptive pathology.[2] We have been equally careful in regard to sarcomata and have even excluded growths which other observers have claimed we should have included—e.g., certain venereal tumours of dogs. As regards the latter, we may say at once that we believe the course of events during the past four years has justified our caution. The high degree of natural infectivity, the constancy of the site of occurrence—viz., the genital organs—and the ease of artificial infection of healthy animals, as well as the processes responsible for infection showed that those tumours differ from other sarcomata which they resemble histologically. We concluded that the tumours were an infective venereal disease of dogs, perhaps comparable to syphilis of man,[3] or better to granuloma pudendi. Sticker,[4] Ewing and Beebe,[22] and others, have opposed this conclusion, but Apolant [5] in the most recent paper from Ehrlich's Institute acknowledges its correctness practically in our own words,[3] even to adopting the analogy with syphilis.

In some of our earlier papers we have devoted great attention to the artificial reproduction of the natural lesions of cancer in mice [6] owing to its importance as a starting-point for experiments. Detailed attention has been given to the nature of transplantation, to the interchangeability of expansive and infiltrative growth, and to extension by the blood-vessels and lymphatics; in short, to the reproduction of all the features of the primary or sporadic tumours. Although the evidence thus advanced must appear convincing to all who have studied it in unbiased fashion, the experimental study of cancer has been subjected to much criticism, both at home and abroad. It seems necessary to meet this criticism in the frankest manner. At home some of it has been deliberately designed to inspire distrust in the experimental study of cancer, and particularly in that aspect of the work of the Imperial Cancer Research Fund, the only institution avowedly engaged in its pursuit in this country.

In the present paper are described certain anatomical and pathological features of sporadic tumours of the mouse. Detailed descriptions of a large number of similar tumours will be given by Bowen, Haaland, and ourselves in the Third Scientific Report now in course of preparation. The anatomical distribution of the tumours will be shown to correspond to that of the mamma. The histological differentiation they present will be referred to the normal histology of this organ in the mouse. The local infiltrative extension of the growths at their

* The superior figures occurring throughout the article refer to the bibliography at the end.

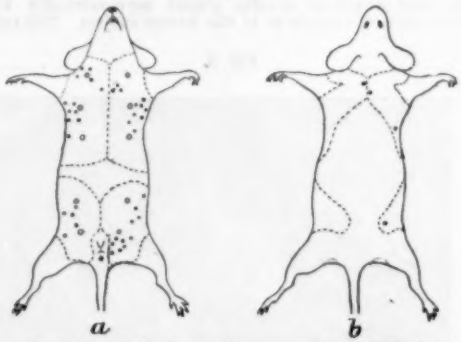
primary sites will be described. The formation of metastases by way of the blood and lymph streams will be clearly set forth. The evidence, added to what we have already published, leaves absolutely no reason to doubt that these tumours are epithelial new growths of the mouse, that they are malignant, and identical in nature with similar malignant new growths of the human subject. Therefore the results of experiments based on them must have direct importance with reference to the study of the disease in man, provided of course due caution be exercised when making comparisons between man on the one hand and the mouse on the other.

The development of the experimental study of cancer in the last four years has been achieved almost entirely as a result of the relative ease with which certain tumours of the mammary region of the mouse can be propagated artificially in normal animals of the same species. This line of inquiry has advanced rapidly. The new and interesting points of view opened up have engrossed those actively engaged in the work. They have proceeded to obtain new light on the nature of cancer, without engaging in the laborious task of convincing all and sundry of the soundness of the anatomical and histological basis of their investigations. The negative criticism to which experimental cancer research has been continuously subjected has repeatedly shifted its ground, while new facts coming to light have more and more fully justified confidence in experimental investigations.

The objections raised against regarding these tumours as mammary carcinomata are as various as the authors who have raised them; practically no two are agreed either on their actual features or on those of malignant growths in the human subject justifying the objections. They can be grouped in three classes. 1. The sporadic tumours in mice are stated to be not cancer at all. 2. The facts elicited in the course of their experimental propagation are stated to be so out of accord with clinical and pathological observations on the human subject as to have little or no value. We shall refer to the preceding objections in detail below. 3. The third class of objections can be summarily dismissed, since they are entirely misdirected. They pertain to matters of quite subsidiary importance, compared with the larger question of whether these tumours permit us to study any form of cancer experimentally. The resuscitation[7] of the opinion of Eberth and Spude,[8] now only maintained by Lazarus-Barlow, that such tumours are endotheliomata, is one example. Ribbert, while regarding them as epithelial tumours of the mamma, denies them malignancy[9] in the sense that they present characters associating them with the malignant tumours of man, mainly, it would appear, because of the difficulties of harmonising the results of experiment with Ribbert's own hypothesis of the origin of cancer. Ribbert has overlooked the fact, that the transplantation of these growths affords the experimental demonstration of his contention, that malignant new growths grow from their own resources only. Others profess to see a quite usual phenomenon in the extraordinary powers of proliferation exhibited by a mouse tumour when artificially propagated,[10] namely, "nothing more than a universal and long recognised capacity in cells." The normal tissues of a mouse, or any other vertebrate, are devoid of similar powers of proliferation. They present a contrast to cancer and cannot be transferred an infinite number of times from one animal to another with retention of undiminished powers of growth. Nor can the transplantation of cancer in the vertebrates be explained by an analogy with the propagation of the higher plants by means of grafts or cuttings. We have already considered this analogy, which so naturally suggests itself, and dismissed it.[11] Apart from its theoretical importance, the value of the artificial propagation of cancerous tissue rests on the fact that it affords opportunities for experimentally modifying the rate of cell growth and multiplication: in other words, for directly attacking that property of cancer by virtue of which it destroys human life.[6]

The objection that the tumours under discussion are not cancer can be dissipated by a knowledge of their pathology and of the normal anatomy and histology of the mouse's mamma in the immature condition, in rest, and in functional activity. The mammæ in the mouse usually consist of five pairs of glands, occupying the sides and front of the body from the neck to the anus. In the shoulder region the gland-acini extend round the sides of the body in front of and behind the fore-limbs, meeting dorsally in the middle line. In the inguinal region there is a similar extension along the crest of the ilium and on the inner aspect of the thigh. The general distribution is shown in Fig. 1, in which the position of 42 spontaneous tumours is indicated also. In Figs. 5 and 6 the extension at the level of the shoulder girdle is shown on the right side of the body, in transverse sections of a mouse with

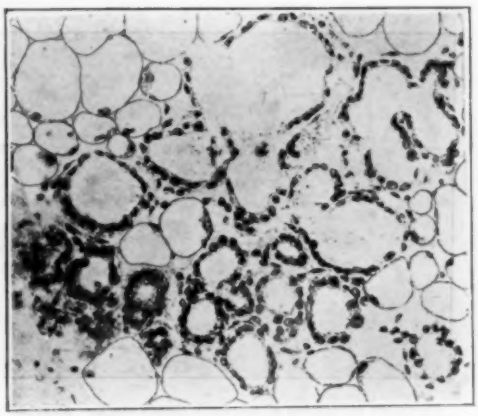
FIG. 1.



a, Ventral, and *b*, dorsal view of a mouse to show distribution of normal mammæ (dotted lines, nipples = 0) and the position of 42 spontaneous mammary carcinomata of which three were in males.

a large carcinoma in the left axilla. It is evident that the tumours with which we are concerned correspond in their distribution to the normal mamma. The cervical region, the axilla, the nape of the neck, the inguinal region, and the vulva are all frequent sites. This distribution, as already pointed out by Apolant[12] and ourselves, of itself indicates the mamma as the tissue of origin. The fully developed gland in a state of rest (when the animal is not suckling), consists of delicate branching acini, lined by cubical epithelium (Fig. 2) and lying in loose

FIG. 2.

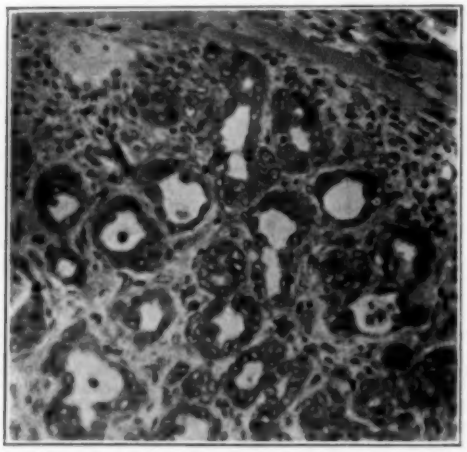


Normal adult mamma. The mouse had borne young but was not suckling. Shows variability of lining epithelium from cubical to flattened cells, according to the degree of distension of acini by secretion.

areolar and fatty tissue subjacent to the panniculus carnosus which, in the mouse, forms an almost complete sheath to the body. During active secretion the acini become dilated and form branching sinuses. The lining epithelium frequently becomes stretched till it resembles a pavement epithelium or endothelium. Fig. 3 illustrates the gland-like characters of an adeno-carcinoma and that its relation to the panniculus carnosus corresponds to that of the mamma. In the new-born female the gland is much less extensive and forms a few branching columns of cells in the vicinity of the nipples. The acini are usually solid, although lumina can be recognised in places. For the most part, the position

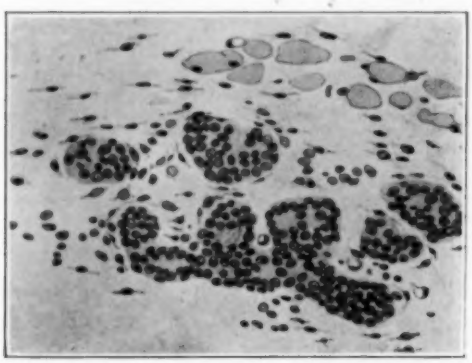
of the future lumen is merely indicated by the recession of the closely packed nuclei from the central part of the cellular strand (Fig. 4). Cell division is frequent at this period. The gland is growing rapidly. The cells are small, and it is often difficult to say whether an individual nucleus at the surface belongs to the gland parenchyma or to the connective tissue. The tumours first appear as roughly spherical swellings usually placed asymmetrically with reference to the nipple as in the human subject. The small

FIG. 3.



Adeno-carcinoma mammæ showing many small acini, like those of normal mamma. Figs. 2 and 3 same magnification. Note fibres of panniculus carnosus at upper part of the figure.

FIG. 4.



Mammary foundation of new-born female mouse. Alveolar arrangement of cells in strands subjacent to panniculus carnosus.

size of the mouse, and the looseness of its integuments often permit this shape to be retained till the increase in size is incompatible with existence, there being a limit to the amount of tissue which the animal can support. The looseness and elasticity of the skin may permit growth to proceed without invasion of the chest wall in tumours in the axillary region, although the lungs may be almost completely replaced by metastatic growths. Lymphatic glands in the neighbourhood may also present secondary deposits, as in Figs. 7, 9, and 11. These mammary growths frequently appear, on removal of the skin, to be encapsuled completely by a fibrous layer of varying thickness. This "capsule," however, is usually invaded by strands and columns of tumour cells, as in the accompanying figure (Fig. 8). The complete surgical removal of the tumours can be effected only by removing the capsule and surrounding tissues and not by shelling the tumour out of its "capsule" after incision.

When a growth arises in the limited space between the thigh and the pelvic outlet it soon fills up all the available room and then its further extension takes place

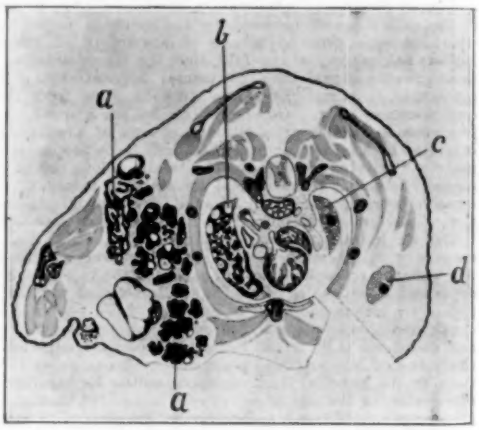
FIG. 5.

Transverse section of a mouse with spontaneous carcinoma mammæ (19). *a*, Hypertrophied normal mamma (lactation). *b*, Cystic mamma anterior to growth. *c*, Mass of growth replacing left lung, lower lobe.

FIG. 6.

Transverse section of same mouse through growth at level of diaphragm. *a*, Normal mamma. *b*, Growth. *c*, Posterior end of growth in left lung. *d*, Metastasis in right lung, upper lobe.

FIG. 7.

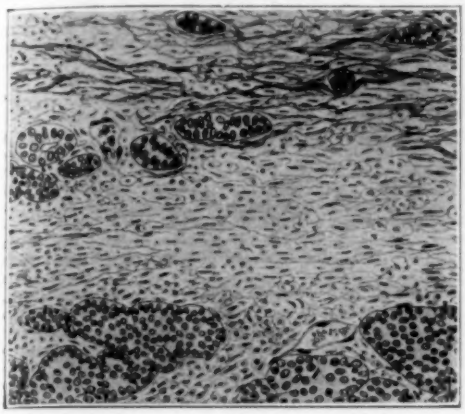


Transverse section of a mouse with spontaneous carcinoma mammæ (23). *a*, Primary growth in right axilla. *b*, Right lung replaced by growths. *c*, Small metastasis in upper lobe of left lung. *d*, Lymphatic gland of opposite side with small metastasis.

in an infiltrative manner, as in the case represented in Figs. 9 and 10. The thigh on the affected side is seen to be twice as thick as that on the healthy side, due to the intercalation of the growth between the muscles. Fig. 10 represents in silhouette the manner in which the growth penetrates between the muscles. The

muscle fibres disappear from between the alveoli of the tumour parenchyma, apparently by pressure atrophy; there is nothing to indicate a digestive action of the tumour on the surrounding structures any more than in the new growths of man. In this case there is also extensive infiltration of the connective tissue between the vagina and rectum. After death this mouse presented large metastases in the lungs

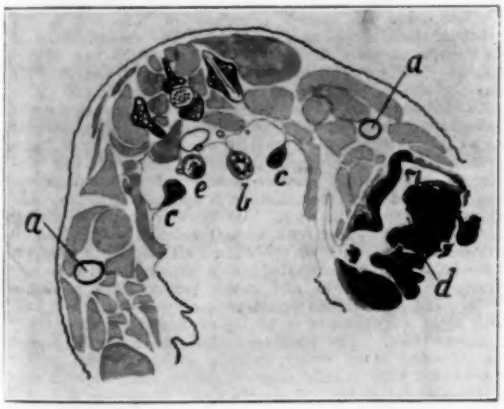
FIG. 8.



Section through "capsule" of a spontaneous carcinoma mammæ of the mouse, alveolar form. Shows infiltration of the apparent capsule by strands of tumour parenchyma.

and, in addition, in the aortic lymphatic glands, as indicated in the section of the whole mouse (Fig. 9) and for a lymph gland alone, under a higher magnification, in Fig. 11. The asymmetrical position of the tumour nodule and the displacement of the lymphatic tissue to form a crescentic margin indicate that growth has commenced in the marginal sinus of the gland as in lymphatic metastasis in the human

FIG. 9.

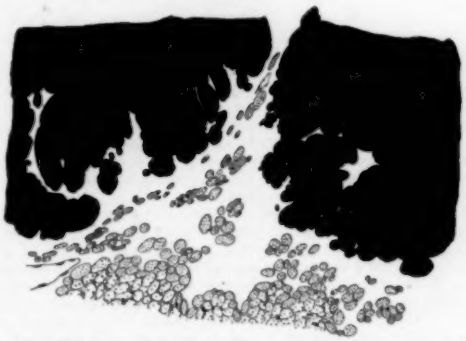


Transverse section of a mouse with spontaneous carcinoma mammæ (46) of the inguinal region. *a a*, Femur. *b*, Rectum. *c c*, Uterus. *d*, Extension of primary growth into muscles of thigh; note thickness as compared with right limb. *e*, Aortic lymphatic gland with metastasis. See Fig. 11.

subject. These illustrations show that we are dealing with new growths of the mammary region of the mouse, which grow progressively (recur after incomplete removal), infiltrate the surrounding normal tissues, and produce metastases of the same histological type in the lungs and lymphatic glands. They lead to the death of the animal. The conclusion is inevitable that they are malignant new growths of the mamma.

We now approach the subsidiary question: Do these tumours arise from the epithelium of the acini of the mammary gland (adenoma, carcinoma), from the endothelium of the blood or lymph-vessels (endothelioma) or from the connective tissue (sarcoma)? There are no other possibilities. The third mode of origin may be discarded at once. They are not sarcomata. A conclusion as to the histogenesis of a tumour is a reasoned judgment based on a knowledge of the histological differentiation of the tumour parenchyma and of the normal tissue implicated, in the various stages of its growth and functional activity. The actual connexion of

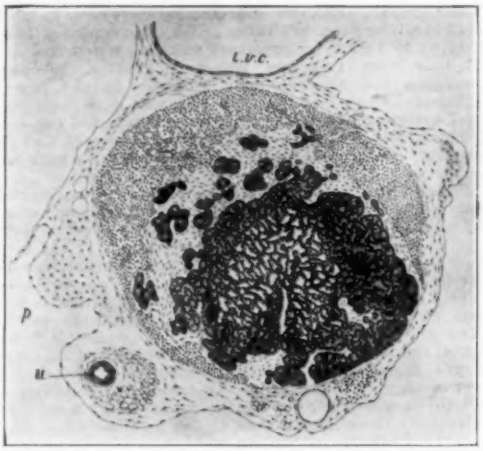
FIG. 10.



Silhouette of margin of growth where invading the muscles of the thigh.

the tumour with its parent tissue is very rarely seen and the conclusion is adopted which harmonises most naturally with these two sets of facts—the normal histology, on the one hand, and the tumour histology on the other. Bearing this in mind, it is easy to show that these mammary tumours of the mouse present a graduated series, from growths built up of small acini, indistinguishable from those of the normal resting mamma, through others, in which the acini are dilated into cystic spaces, reproducing in an exaggerated form the puerperal condition, to alveolar growths, built on

FIG. 11.



Aortic lymphatic gland with metastasis from same case. *I. v. c.* Inferior vena cava. *p*, Peritoneum. *u*, Ureter.

the plan of the rapidly growing mammary foundation of the new-born mouse. We do not regard this similarity of alveolar carcinoma to immature normal mamma as indicating a return to an embryonic condition,[13] but merely as showing that an epithelium which will certainly differentiate into a mass of acini lined by one layer of cubical cells may pass through a growth-form in which many layers of cells or solid

columns of cells predominate. Therefore the presence of similarly constituted alveoli in a tumour does not preclude that they have arisen from simple acini lined with one layer of cells. These tumours present us with every imaginable intermediate stage from pure adenoma to alveolar carcinoma, and our classification must recognise the continuity of this series of histological appearances. Adenomatous and solid alveolar portions are frequently encountered in the same growth. The situations in which they occur indicate clearly, in many instances, a mechanical influence as determining the histological appearances. The transplantability of many of these tumours gives further opportunities for determining the share of mechanical conditions in modifying the histology. With the development of this line of inquiry we shall soon see that, instead of attempting to classify mouse tumours in accordance with human histology, the results of experiment will force us to modify the rigidity of the classification now in vogue. The clinical, pathological, and cytological distinctions which even to-day it is sought to draw between benign and malignant growths break down entirely in the face of the facts revealed by the comparative and experimental study of cancer. It is becoming more and more certain that the explanation of growths in the one class will also elucidate the nature of those in the other.

Our knowledge of cancer in mice is by no means limited to carcinoma mammæ as seems to be generally believed. We have described and figured an adeno-carcinoma of the duodenum,[6] and a similar case has been described by Bulloch and Twort[14] in which extensive secondary growths were present in the liver. We have also described a case in which the histological appearances were those of the pancreas.[6] In yet another case Jensen found a large growth surrounding the kidney in a mouse which we had sent to him: it had the structure of a spindle-celled sarcoma. Haaland has described[15] a number of malignant growths in mice observed in Borrel's laboratory, and we have already reproduced a figure[16] of one of several cases of squamous-celled carcinoma of the floor of the mouth described by him. The carcinomatous ulcer in that case reproduced the appearances in the same site in the human subject very closely. The secondary growths in the marginal sinus of the submaxillary lymphatic gland are typical. The invasion and destruction of the ramus of the lower jaw complete the clinical and pathological picture in this most interesting case. Haaland has also published[17] preliminary accounts of multiple enchondromata, of chondro-sarcoma, and of squamous epithelioma of the vulva. The typical features of the last case entirely dispose of the doubts expressed by Erdheim[18] in regard to a similar growth. Haaland will describe these cases in more detail in a future communication. We cannot refrain from referring to Ehrlich's[12] important material, which includes not only very numerous mammary growths, but also chondroma and spindle-celled sarcoma. In the papers published by the many investigators who have large personal experience of cancer in mice there is not one discordant note. Michaelis has authorised us to state that he is wrongly quoted[10] as holding that the growths in mice are not cancer.

The criticism that the facts elicited by the experimental study of cancer are out of accord with clinical and pathological observations on the human subject, has done duty repeatedly with reference to other diseases. It has been brought forward whenever the first fruits of experimental investigations have clashed with empirical conceptions—clinical or pathological. It is matter of history that it was used with effect on Villemin's early experiments on the infective nature of tubercle and applied also to Koch's monumental research in which he finally demonstrated the cause of the infection. The same battle had to be fought in the case of diphtheria. This form of criticism is one to be welcomed, for on the whole it has a salutary influence, although its volume in the past has often been merely an indication of the number of those who were unable to grasp novel conceptions or unwilling to appreciate their importance.

We wish to refer briefly to certain specific objections. Wilks[19] pointed out over 40 years ago, on the basis of experience gained in the performance of 2000 necropsies at Guy's Hospital, "the cachectic condition spoken of in cancer is a result of the disease, and does not pre-exist, and in very many cases is not present at all, and depends, as we have before remarked, upon accidental circumstances." Sir Samuel Wilks's words can be applied equally to mice suffering from cancer, either natural or induced. If we interpret recent surgical papers correctly, e.g., those by Mr. G. L. Cheatle,[20] our opinions coincide with his in this matter. The spontaneous disappearance of tumours in the human subject in its relation to the similar phenomenon in mice after successful inoculation was first referred to by us in the course of a discussion at the Medical Society of London in March, 1905.[21] At that meeting Mr. J. Langton and Mr. H. J. Waring recorded their personal experience of its occurrence and other surgeons have done so since. A most interesting case has been recorded quite recently by Mr. W. Bruce Clarke.[22] With Cramer we have fully described the nature of the process in mice and pointed out its identity with what Orth[23] had described for epithelioma of the human tongue. In regard to mice with inoculated tumours, the importance of the phenomenon has also been emphasised independently by Clowes.[24] Clowes and Gaylord[25] tabulated the recorded cases in the human subject and confirmed our description and figures in the case of mice. Those objecting that its relative frequency shows cancer in mice is not comparable with cancer in man have entirely overlooked the fact of our statements referring to cancer when transplanted in normal animals rather than to sporadic growths in the animals spontaneously attacked. The great importance of this phenomenon cannot be denied. Its apparent novelty has, perhaps, much to do with the incredulity with which our statements have been received. In the human subject, in chorion epithelioma, spontaneous healing of the secondary growths presents the closest parallel to its occurrence in experimental cancer. In chorion epithelioma we have a form of cancer which is naturally transferred from one individual to another by transplantation—viz., from the cancerous chorion to the healthy mother. The frequency of the spontaneous healing of the secondary growths thus occurring in the mother is a matter of common knowledge among pathologists. Mr. Pearce Gould has drawn attention to spontaneous healing of cancer of the human breast and of the secondary nodules in melanotic sarcoma. Mr. W. S. Handley has emphasised the significance of the phenomenon. On the one hand, the human organism is able to protect itself against malignant growths, at least occasionally, and perhaps more frequently than we are yet aware of. On the other hand, mice inoculated with cancer are very frequently able so to protect themselves in certain favourable circumstances.

As regards statements which have been made about the frequency of infection in mice, we have discussed this subject so often that we can dismiss it by reiteration of the facts. We have taken every care to show how absolutely distinct from all known processes of infection is the artificial transference of the disease. The establishment of this distinction by Jensen[27] and by us[1 2] is one of the salient results of the experimental study of cancer. We have observed the effects of inoculating 60,000 mice with carcinomata. The animals have been kept under painstaking observation. The development of tumours that could be referred to infection or contagion has been observed in not one single instance. Ehrlich[13] has performed a somewhat smaller number of inoculations but has employed a greater number of sporadic growths. His experience agrees with ours. The housing of mice suffering naturally from cancer with normal animals has yielded no evidence of infection or epidemics, although our observations have now been extended over a longer period than any previous investigation and much longer than a mouse lives. The spontaneous appearance of tumours in our own and other experiments is to be explained in an entirely different way. The positive statements made in regard to infection when small animals suffering from cancer are housed with normal animals can be referred with confidence to (1) fallacious observations; (2) erroneous deductions as we have already pointed out[28] (Morau,[29] Gaylord[30]); and (3) unwarranted assertions by those without personal experience. In our experiments mice have developed cancer spontaneously, though not by infection. We shall have occasion to revert to this topic. We shall show also how large an allowance must be made when large numbers of small animals are kept under careful observation, since the relative number of cases of cancer developing then more nearly approximates to the absolute incidence of the disease in animals alive in the later adult and old-age periods of life. The very positive statements about infection in the case of mice are at present devoid of all scientific value.

We are unable to comprehend why there should be a feeling that there is something mutually exclusive in the

clinical, pathological, comparative, and experimental methods of investigating cancer. They are really complementary to one another and those who have studied the publications of the Imperial Cancer Research Fund must have perceived that every effort has been made to give each line of inquiry its due importance, and to coördinate them as the respective parts of one extensive investigation. The purely clinical and pathological aspects of cancer have received a large share of attention. The statistical investigations of the Imperial Cancer Research Fund are based on the most numerous and reliable clinical and pathological data yet tabulated. In certain investigations on the earliest stages of squamous-celled carcinoma of the tongue, the ripe clinical experience of Mr. H. T. Butlin was supplemented by experience of a different kind, gained in purely pathological and experimental studies on human and animal material, with most important clinical results.[16]

We beg leave to conclude that the comparative, the biological, and the experimental investigation of cancer is based not only on sound foundations, but that it is advancing our knowledge[24] of the disease more rapidly than any other line of inquiry at the present time.

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ON OPSONINS AND IMMUNITY.[1]

BY J. I. BUNCH, M.D., D.SC. LOND., M.R.C.P. LOND.,
LATE RESEARCH SCHOLAR OF THE BRITISH MEDICAL ASSOCIATION AND ASSISTANT PHYSICIAN TO THE GERMAN HOSPITAL.

(*From the Pathological Laboratory, University College, London.*)

IT has for long been a matter of uncertainty to which of the constituents of the blood its germicidal properties are due. That such properties exist is, of course, undoubted, and some of the earliest experiments on the subject showed that bacteria when injected into the blood stream rapidly disappear. It was shown later that defibrinated blood could destroy various kinds of micro-organisms, although after a time this same blood lost its germicidal properties and became an excellent medium on which the bacteria could grow. The germicidal powers of fresh blood must, of course, depend either on some substance contained in the serum or in the corpuscles, or on some actively destructive action of the latter. The white corpuscles, or phagocytes, have been shown to possess the power of taking up and digesting bacteria, probably by the aid of some intracellular ferment, and the method of which I am speaking—the opsonic method—depends on our ability to estimate the relative capabilities of the phagocytes to take up bacteria (known as phagocytosis) when incubated with and acted on by different blood sera.

Phagocytes are either of the macrophage—i.e., fixed—variety, consisting of endothelial cells, some connective tissue cells, and some cells of the spleen pulp and bone marrow, or of the motile variety, which includes most of the polynuclear and mononuclear leucocytes. When micro-organisms are introduced into the body the phagocytes, both fixed and motile, seize upon the intruders and by means of their pseudopodia absorb them into their interior and digest them. Where the phagocytes are naturally absent or scanty, as in the anterior chamber of the eye and cornea, the invading micro-organisms stimulate the animal's protective mechanism to hurry forward an army of defending phagocytes of the motile kind which give immediate battle to the intruders. This attraction of the phagocytes is due to what is known as positive chemiotaxis, and is most marked in those cases where the natural immunity is greatest—indeed, the greater the natural immunity of the organism to infection the greater is the positive chemiotaxis. When the bacteria have been taken up into the phagocyte they are either digested by some ferment action or destroyed by some chemical poison possibly related to nucleic acid, but this action is not immediate and the bacteria are not instantly killed. This is shown by injecting into an animal phagocytes containing bacteria, and it is found that by doing this we can induce infection in the susceptible animal. If the bacteria are very virulent and the phagocytes are placed under disadvantageous conditions the bacteria may get the better of the phagocytes and kill them, or, if spores have been taken up by the phagocyte, these may develop within the phagocyte into bacteria and destroy the phagocyte.

The influx of these white corpuscles, or phagocytes, to an infected area means that the organism is resisting the invading forces which threaten disease. The phagocytes are aided in their struggle by poisonous substances circulating in the fluids of the body, secreted possibly by the white corpuscles, which act upon the bacteria in such a way as to prepare them for digestion by the phagocytes. These bacteriotropic substances, or opsonins, make ready or prepare the bacteria for the further action of the phagocytes. The word "opsonin" is derived from *ὀψωνέω*, meaning "I cater for." That opsonins have this action is proved by the following experiment of Wright and Douglas. Two tubes are incubated for a quarter of an hour at 37° C., the one containing three volumes of normal serum *plus* one volume of staphylococcus emulsion (previously heated to 75° C. and cooled), the other containing three volumes of serum which had been heated to 60° C. *plus* one volume of staphylococcus emulsion (previously heated to 75° C. and cooled). On removal from the incubator the first tube (containing normal serum) is heated to 60° C. and cooled. The contents of each tube are then added to three volumes of white blood corpuscles and the number of staphylococci taken up per phagocyte is counted. It is found that the number of staphylococci taken up in the second case is only one-seventh as compared to that taken up in the first case: in other words, the opsonin acts directly on the bacterium.

The opsonic index of a patient to any one micro-organism is simply the expression of the relative power of the patient's opsonins to influence the taking up of the micro-organism by phagocytes, as compared to that of a healthy individual. For instance, 50 phagocytes can when incubated with a tuberculous patient's serum take up 100 tubercle bacilli, while 50 of the same strain of phagocytes when incubated with the serum of a healthy person take up 150 bacilli in the same time. The patient's opsonic index is then the ratio of 100 to 150, or $\frac{2}{3}$, or 0·6.

The actual estimation of the opsonic index can only be carried out in a laboratory, but all that the physician in charge of a case has to do is to fill a specially prepared tube with blood and forward it to the bacteriologist and in 24 hours he can be advised what the patient's opsonic index is and what dose of vaccine should be administered. The method of estimation is as follows:—

(*a*) Two specimens of blood are obtained (by pricking the finger and allowing the blood to flow into a glass tube), one from the patient and one from a healthy person. These

[1] In part a lecture delivered at University College, London, on Feb. 5th, 1907.

tubes are sealed up by placing the ends of the tubes in a flame and the blood is allowed to clot, forming a clear layer of serum.

(*b*) 0·5 cubic centimetre of blood is drawn from the finger into a tube containing 10 cubic centimetres of sterile 1·5 per cent. sodium citrate solution and shaken up. Sodium citrate combines with the calcium salts of the freshly shed blood and prevents clotting. The tube is placed in the centrifugal machine for five minutes until the corpuscles have sunk to the bottom and the fluid is pipetted off. 10 cubic centimetres of normal saline solution are placed in the tube and the tube is shaken to wash the corpuscles and then replaced in the centrifugal machine for five minutes. This is repeated twice again and the fluid above the corpuscles is finally removed. A layer of white corpuscles free from serum is now available.

(*c*) An emulsion of the bacterium in salt solution (1·5 per cent.) is made by pouring the latter over a 24 hours' growth on agar and shaking. The fluid is removed and centrifugalised until the right density of emulsion is obtained.

The two specimens of serum, the washed phagocytes and the emulsion of bacteria, are now ready for use and are labelled and placed in a rack or vessel containing wet sand. Two sterile capillary pipettes fitted with rubber nipples are marked at a distance of one centimetre from the end with a blue pencil, and into each are drawn up the following fluids. Into the first, equal volumes of healthy serum, washed blood cells, and bacterial emulsion. Into the second, equal volumes of patient's serum, washed blood cells, and bacterial emulsion. The contents of each pipette are thoroughly mixed and drawn up again into the respective pipettes. The two pipettes are sealed at the capillary ends and both are placed in an incubator at blood heat for 15 minutes. Of course, if the sera of more patients have to be examined at the same time similar pipettes, each containing one patient's serum, washed blood cells, and bacterial emulsion, are placed in the incubator also for 15 minutes and examined against the control. At the end of 15 minutes the two pipettes are taken out of the incubator; a blood film is prepared from each, stained by Leishman's method, and examined under a $\frac{1}{12}$-inch oil immersion lens, using a mechanical stage. The number of bacteria contained in 50 polymorphonuclear cells is counted in each case, and since normal serum is taken as having an opsonic index of unity, the number of bacteria contained in 50 cells on the patient's slide, divided by the number in 50 cells on the control slide, gives the opsonic index of the patient.

Fallacies may, of course, occur in the hands of inexperienced workers, especially if the tubes be incubated for different periods, or the serum be heated, or the films imperfectly prepared, or the volumes incorrectly measured. But by practice a wonderful degree of accuracy can be attained.

Having determined the patient's opsonic index we have now to see whether we can raise it, if low, by the employment of bacterial vaccines. It is well known that many living organisms produce, during their growth, substances inimical to themselves. For instance, yeast grown on grape sugar produces alcohol, and this alcohol finally stops the growth of the yeast. Many bacteria in the same way produce during their growth substances (antibodies) which are injurious to themselves. Tuberculin contains such antibodies and is hence employed in tuberculous lesions, but in the old days much too large doses were employed and there was no method of checking its effects. Now, very small doses are given and we can tell with great accuracy what the results of each dose are. Nevertheless, tuberculin treatment must still be combined with other methods, and only under such conditions can bacterial vaccines be expected to give the best results.

The employment of sterilised bacterial cultures in the treatment of disease is based essentially on the assumption that by this means we can increase the germicidal substances of the fluids of the body and bring about a more or less marked artificial immunity. It is well known that immunity to snake poison can be induced by giving repeated small non-fatal doses of the toxin. 20 years ago it was shown that pigeons could by this means be made immune to the poison of the rattlesnake. This acquired immunity is, of course, to be distinguished from both natural and inherited immunity and may be either active or passive. Active immunity is brought about in the body of the animal as a result of the stimulus produced by the injection of bacterial cultures; passive immunity is the result of directly injecting substances which can combine with and neutralise toxic bodies in the infected organism. Thus, in the case of diphtheria, active immunity can be produced in the horse by the injection of gradually increased doses of diphtheria toxin until its serum contains a considerable quantity of diphtheria antitoxin. This serum when injected into a patient suffering from diphtheria can neutralise a certain proportion of the toxin by virtue of the antitoxin which it contains, and so prevent some of the pathological changes in the patient's cells which would otherwise be brought about by the diphtheria toxin. By the injection of such antitoxin passive immunity is said to be produced in the patient.

Natural immunity to poisonous substances is possessed in various degrees by different animals. Thus large quantities of antimony and arsenic can be consumed by pigs without ill-effects, and the vapour of formalin, which is, of course, a strong antiseptic, is not only without effect on certain insects but they actually appear to thrive on it. Typhoid fever, so fatal to man, cannot be induced in the lower animals by inoculation with the typhoid bacillus, nor does the disease occur naturally in them, any more than do measles, scarlet fever, and leprosy. On the other hand, certain species of animals are susceptible to anthrax, such as sheep and cattle, whereas many other of the lower animals are quite insusceptible to the disease. But although some animals are immune to certain diseases and cannot be inoculated with the micro-organisms which produce these diseases, they are, nevertheless, susceptible to doses of the toxin produced by these micro-organisms and injection of typhoid toxin is fatal to many of the lower animals which cannot contract the disease. The toxin of cholera is harmless to the larva of a certain beetle, and if the same dose of cholera toxin is given to one of these and also to a small frog of equal weight the latter dies while the former is unaffected. If, however, the two are inoculated with the bacillus of cholera the frog escapes but the beetle dies. It is evident that this may apparently be explained on the assumption that the leucocytes of the beetle are able to get the better of the cholera toxin but not of the bacilli, and *vice versâ* in the case of the frog, but what is not so easy to explain is why the beetle is unaffected by the cholera toxin introduced from outside, while it succumbs to that manufactured in its own body.

The mode of entry is often of the greatest importance in the future development of an invading organism. Thus the organism of Asiatic cholera is extremely fatal when taken into the alimentary canal, although it is almost harmless when injected subcutaneously. Tetanus bacilli and anthrax bacilli, however, when injected subcutaneously are very fatal, but if taken into the healthy alimentary canal they are practically harmless. The bacillus coli is normally found in the human intestinal canal and under such conditions produces no ill-effects because its toxic material is locked up inside the cell, but if the bacillus escapes into some position where by phagocytic or other action its intracellular toxin is set free pathological effects are speedily produced. The mode of entry of the tubercle bacillus and the nature of the bacillus which can cause tuberculous lesions in the human being are subjects which have been dealt with at length by the recent Royal Commission, and we are only concerned here with methods which can arrest the progress of disease in an already infected organism.

An increase of the opsonic content of the blood in disease is brought about by the injection of the appropriate vaccine—e.g., of tuberculin in tuberculosis, of staphylococci in boils and acne, and of gonococci in gonorrhœa. When possible the micro-organism should be grown directly from the patient's lesion and a small quantity of the pure culture, whether staphylococcus, tubercle bacillus, or other organism, triturated with normal saline solution to which ¼ per cent. lysol is added. The mixture is heated to 60° C. for an hour in order to kill the bacteria and make the vaccine sterile. The number of bacteria in a given volume is now calculated by mixing one volume with an equal volume of blood and two volumes salt solution and counting the relative number of bacteria and red corpuscles. It is known that normal blood contains about 5,000,000 red cells per cubic millimetre and the number of bacteria per cubic millimetre is therefore readily calculated and a vaccine of the required strength is easily prepared by dilution. An initial dose of 300,000,000 staphylococci, or $\frac{1}{333}$ milligramme of tuberculin, is given with a sterile hypodermic syringe subcutaneously. The injection should cause no rise of temperature and no general or appreciable local reaction. The amount of the dose given

at subsequent injections and the intervals between the doses must depend on the influence produced by the preceding dose on the opsonic index.

If the right dose has been given a short negative phase will be followed by a well-marked positive phase, during which the anti-bacterial power of the blood is increased and the resistance of the patient to the disease increased. After tubercle inoculations this improved power of resistance may be maintained for several weeks, but, as a rule, it falls back again after ten days or a fortnight, and a further dose of the vaccine is necessary. Only the minimal dose must be employed which will produce a satisfactory response and this must not be increased until it ceases to produce its effect. The dose, moreover, must not be repeated until the effect of the preceding dose is passing off. If it were possible to produce a summation of positive phases it would be advantageous to give successive doses at short intervals, so as to produce a maximal favourable effect, but such summation is not possible in the case of tubercle. Each inoculation, therefore, produces its effect independently and it remains to take the greatest advantage possible of the increased elaboration of protective substances which the artificial stimulus has produced.

The results of treatment of some dermatological cases have already appeared in a paper by Pernet and myself in the October, November, and December numbers for 1906 of the *British Journal of Dermatology*. Some cases were also included in a paper of mine in THE LANCET of Jan. 19th, 1907, p. 144. So many other successful cases have now been recorded that the employment of bacterial vaccines must in the future prove of the greatest service in the treatment of disease when controlled by the method which Wright and Douglas have so ably elaborated. In conclusion, I have much pleasure in thanking Professor Sidney H. C. Martin for his kindness, encouragement, and advice.

Park-street, Grosvenor-square, W.

A NOTE ON TESTS FOR ACETONE IN THE URINE.

BY BASIL J. F. JACKSONTAYLOR, L.R.C.P. LOND., M.R.C.S. ENG.,

HOUSE PHYSICIAN, PADDINGTON GREEN CHILDREN'S HOSPITAL.

A FEW words on the tests for acetone in the urine may not be out of place at the present juncture when the conditions of recurrent vomiting with acetonuria are attracting so much attention. The tests ordinarily employed are: (1) the iodoform test; and (2) the sodium-nitroprusside test. The first mentioned is simple and, I believe, yields absolute evidence (with certain exceptions) together with microscopical examination of the iodoform crystals. The smell of iodoform produced when performing this test is unreliable, as a similar smell to that of iodoform is produced when iodine and alkaline solutions are added to urine irrespectively of the formation of iodoform. If acetone is present in small quantities distillation of the urine is advisable.

The sodium-nitroprusside test, which consists in the darkening which takes place on the addition of acetic acid to a solution of sodium-nitroprusside, urine, and liquor potassæ, is, I think, rendered more simple, delicate, and accurate by a slight modification—namely, the substitution of strong ammonia for the liquor potassæ and the elimination of the use of acetic acid. In the ordinary test when the solution of potash is employed there is a uniform reddening of the whole solution which on the addition of acetic acid in the presence of acetone becomes darker when the acid comes in contact with the urine, the darkening passing down as the acid sinks. Therefore, with this test the addition of liquor potassæ to the urine and sodium-nitroprusside yields a red colouration whether acetone is present or not, and it is only after the final addition of acetic acid that the presence of acetone is recognised and then only when there is a fair amount of the latter present. The detection of the presence of acetone is therefore dependent on the darkening of an already darkish red fluid by the final reagent acetic acid, and the degree of darkening, when acetone is present only in small quantities, is not altogether easy to determine. If, however, strong ammonia replaces the potash solution the test for acetone is as follows. On adding the ammonia to a solution of sodium-nitroprusside and urine the ammonia solution remains on the top; thus there is a clear solution uppermost with the urine solution below. Should acetone be present, even in minute quantity, a well-marked and absolutely characteristic ring of magenta (or petunia) appears within from one to three minutes at the junction of the two fluids and gradually *spreads upwards* pervading the whole of the ammonia solution if acetone is present in considerable amount. In the absence of acetone usually no colouration occurs, but sometimes an orange-red ring forms at the junction of the urine and ammonia solution, but this bears no resemblance to the "acetone ring" described above, hence the presence or absence of the latter is easily ascertained by the method which I believe has not been generally recognised.

The strength of the solution of sodium-nitroprusside is not important, but it is important that it should be prepared fresh and a few crystals dissolved in a test-tube of water are sufficient.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF RUPTURE OF A VERY EARLY EXTRA-UTERINE GESTATION; LAPAROTOMY; RECOVERY.

BY C. A. SCOTT RIDOUT, M.S., M.B. LOND., F.R.C.S. ENG.,

SURGEON TO THE PORTSMOUTH AND SOUTH HANTS EYE AND EAR INFIRMARY; HONORARY PATHOLOGIST TO THE ROYAL PORTSMOUTH HOSPITAL.

THE following case is somewhat unusual owing to the early age of the extra-uterine conception and the entire absence of signs and symptoms preceding the rupture.

On Oct. 28th last I was asked by Dr. M. Aston Key of Southsea to see a young married woman in consultation who was presenting signs of some severe abdominal lesion. The patient was a healthy young woman, aged 23 years, who was married as recently as August 29th, 1906. Shortly after this date she had a regular menstruation period lasting for one week; at the end of September another regular period took place and on Oct. 22nd she again began to menstruate. This last period was rather shorter than usual and ended on the 26th. Otherwise she was in excellent health and attended a concert on the 27th. There had been no history of dyspepsia, hæmatemesis, or melæna. Early in the morning of the 28th on going downstairs she felt very faint and experienced severe pain in the hypogastrium rather to the right side; she revived and fainted again and this recurred several times during the morning. Vomiting occurred once in the afternoon and showed no peculiar characteristics. As she was getting much worse her medical attendant was summoned. When I saw the patient about 6.30 P.M. she was lying on her left side, moaning and in a very collapsed condition. Her skin was blanched; the pulse at the wrist was only feeble, flickering, and uncountable; the pupils were dilated; the abdomen was tumid, not distended, and below the umbilicus it was dull to percussion. She was anæsthetised with ether and an incision was made to the right of the linea alba through the right rectus abdominis muscle below the umbilicus. On opening the peritoneal cavity about two quarts of dark blood and clots escaped. The right Fallopian tube and ovary were normal, but in the region of the isthmus of the left tube there was a small swelling of the size of a hazel nut, from a small opening in which was presenting a small bunch of chorionic villi, which came away during handling and was unfortunately mislaid. The left Fallopian tube was then removed, considerable difficulty being experienced in securing all bleeding points on the uterine wall, some of which had to be included in passing the ligatures. The left ovary was normal. The lower half of the peritoneal cavity was then cleansed with absorbent pads and the wound was closed by peritoneal, muscular, and cutaneous sutures. The patient was in a profound state of collapse and so two pints of saline solution were infused into the right arm intravenously. She rallied soon after the operation, however, and made an uneventful recovery, being able to get up in three weeks' time.

The situation of the pregnancy in the isthmus of the Fallopian tube undoubtedly led to its early rupture. The

tumour, from its size and the smallness of the bunch of chorionic villi, could not have been of more than four weeks' growth.

As regards the diagnosis, the signs and symptoms presented by the patient undoubtedly pointed to internal hæmorrhage of an extensive character and this led me immediately to explore the region of the Fallopian tubes as being the most probable source of the hæmorrhage occurring thus suddenly in a young, healthy, rosy-cheeked woman, particularly as vomiting was a late and unimportant symptom and there was no hæmatemesis or melæna. The slight shortening of the last menstrual period was the only symptom at all indicative of any pregnancy and this one must own was a very slight one. Still, I consider it is always important to make very searching inquiries into the menstrual history and I think that this opinion is confirmed by this case.

Southsea.

NOTES OF A CASE OF STRANGULATED HERNIA ASSOCIATED WITH ACUTE HÆMORRHAGIC PANCREATITIS.

BY WALTER H. BROWN, F.R.C.S. IREL.

THE patient in the following case was a man, aged 60 years, and was admitted into the Leeds General Infirmary on August 2nd, 1903. The previous history was to the effect that he had enjoyed good health up to the day before admission, but on the evening of that day he was seized with a sudden and violent pain across the abdomen between the umbilicus and pubes. He vomited once or twice during the night. On admission the abdomen was somewhat distended and tender. There were a large hydrocele on the left side and a large hydrocele and hernia on the right side. The hernia was irreducible and tender. Shortly after admission he vomited a few ounces of dark fluid having a distinctly fæcal odour. His general condition was extremely bad, his pulse was 130 per minute and very feeble, and he was obviously in great distress.

After ether had been administered the hernia was operated upon and was found to consist of a large coil of small intestine, deep purple in colour, but not strangulated completely. The bowel was returned without trouble and the pillars of the ring were sutured. The operation evidently had no material effect towards giving relief; he continued to vomit at intervals and died next day. It may be well to note here that flatus was passed several times after the operation, but none before it.

At the necropsy it was found that the scrotum contained a double hydrocele; behind the one on the right side there was an old hernial sac now empty; the inguinal canal was closed by suture. The lungs were much congested. The heart was normal. After opening the abdomen and removing the liver the parts in the neighbourhood of the lesser sac of the omentum gave way easily. The head of the pancreas was natural in size but very deep-coloured. On the upper aspect of the body of the pancreas there was a greyish slough of about the size of a walnut. The lesser sac was full of dirty curdy fluid resembling pus. The foramen of Winslow was closed. There was extensive fat necrosis of the great omentum and mesentery. The gall-bladder was full of small stones; the spleen was very soft; the kidneys were small and granular.

This was the first case of acute pancreatitis that I have had the opportunity of seeing post mortem. I observed at the time of the operation that the patient was far more ill than could be accounted for by his physical signs. The hernia, however, was irreducible and might, if gangrenous, be responsible for all the symptoms noted. After the operation I felt convinced that some intraperitoneal catastrophe had occurred but the patient's condition did not warrant further operative measures. Nor would any surgical procedure have afforded much chance of saving life, as, for instance, draining the lesser sac, fat necrosis being already present. Whilst it may be possible to diagnose pancreatitis in a given case observed during days of gradual onset I do not see how a surgeon is even to suggest its presence in an acute attack, more especially when the condition is associated with irreducible hernia. In the present case the disease was ushered in with no special symptom other than the familiar "sudden pain in body with vomiting," which symptom in scores of cases disappears and gives no further trouble. Alike from the patient's point of view and the surgeon's it is unfortunate that inflammation of the pancreas may occur without previous warning of any kind, and may prove fatal in 48 hours without exhibiting any distinctive symptom, so that the nature of the illness is only discovered at the necropsy.

The pancreas physiological is a peaceful organ, the pancreas pathological can be even as rapidly fatal in its attack, as the most virulent fulminating appendicitis.

Leeds.

Medical Societies.

PATHOLOGICAL SOCIETY OF LONDON.

Anti-typhoid Inoculation in the Army.—Observations on the Spirochætæ of Relapsing Fever and Tick Fever.—A Note on Blackwater Fever in Sierra Leone.—A Pseudo-diphtheria Bacillus from a case of Middle-ear Disease.—Bacillus Typhosus from Periosteal Abscess One Year after Typhoid Fever.

A LABORATORY meeting of this society was held at the Royal Army Medical College, Dr. P. H. PYE SMITH, the President, being in the chair.

Lieutenant-Colonel W. B. LEISHMAN, R.A.M.C., gave an account of the progress of Anti-typhoid Inoculation in the Army since the resumption of the method was authorised by the Army Council on the recommendation of the committee appointed by it to investigate the subject. The inoculations were voluntary but every effort was being made to popularise the method by means of lectures to all drafts and regiments proceeding on foreign service. As far as possible the inoculations were carried out before embarkation, but owing to various reasons the second inoculation was sometimes performed on board the transport. For this purpose vaccine was placed on board every outward-bound ship. The inoculations were also being carried out on a large scale in India and elsewhere and 20,000 doses of vaccine had been prepared and issued from the Royal Army Medical College during the last 12 months. Research work in connexion with the method had been carried on uninterruptedly at the Royal Army Medical College by Lieutenant-Colonel Leishman and his colleagues, Major Harrison, Major Grattan, and Lieutenant R. G. Archibald, and a short account was given of the lines of investigation and the practical bearing of some of the results upon the methods of preparing and standardising the vaccine. Numerous vaccines had been prepared from typhoid bacteria killed at different temperatures, by various chemical agents, by desiccation, &c., and their effects tested by measurement of the various protective substances which developed in the blood of inoculated animals. In several instances where the results appeared promising similar tests were carried out on man. The vaccine at present in use was described and an account was given of the mode of preparation and standardisation which had been somewhat modified from Sir A. E. Wright's methods in the light of the experimental work referred to. The bacteria were still killed by heat, but the temperature had been reduced to the minimum degree which would insure death in one hour—53° C. The deleterious effects of higher temperatures had been clearly brought out by some of the experimental work and it was suggested that the comparatively poor results obtained in some instances in the past might have been due to over-heating of the vaccine. The system adopted for ascertaining the protective value of the inoculations was then described, and the result of the inoculation of the 17th Lancers was given. This regiment, the only one which had been exposed to a severe epidemic of enteric fever since the modified vaccine had been in use, had 147 officers and men inoculated out of a strength of 509; they had 62 cases of enteric fever with 11 deaths; all of these occurred among the uninoculated with the exception of two, both being men who had refused the second inoculation; both of these men recovered.

Lieutenant-Colonel LEISHMAN, in a paper on the Spirochætæ of Relapsing Fever and Tick Fever, after referring to the interesting nature of the problems awaiting solution in connexion with many spirochæta infections, described the results of his own observations. His material consisted of films of blood from cases of African tick fever and of relapsing fever from Austria, Aden, and several parts of India; in addition, through the kindness of Professor Karl

Fraenkel he had had the opportunity of studying the living organisms of tick fever and of relapsing fever, the latter being the strain isolated in America and described by Novy and Knapp. Lieutenant-Colonel Leishman had studied the development of these organisms in white mice and, contrary to the usual experience, had found both strains equally fatal. The effect of passage appeared to be an undoubted increase in the virulence of the spirochætæ as evidenced by the earlier appearance of the organisms in the blood and their more rapid multiplication. He had failed entirely to confirm Novy and Knapp's description of easily recognisable morphological differences between the spirochætæ of tick fever, European relapsing fever, and Indian relapsing fever, and had found wide variations in each case in respect of such features as length of the individual cell, number and depth of curves, tendency to formation of loops and figures of eight, &c. The inconstancy of these features appeared to him to depend upon such factors as the vitality of the organism, the stage of the disease, the method of fixation, &c. From other evidence, such as that of the immunity experiments of Breinl and Kinghorn and of Fraenkel, there appeared to be no doubt of the specific difference between the spirochæta of tick fever (spirochæta Duttoni) and relapsing fever (spirochæta Obermeieri), but further work appeared necessary to prove the existence of two or more varieties of relapsing fever. As regards the biological nature of these spirochætæ which Novy and Knapp consider to be true bacteria Colonel Leishman pointed out that considerable differences of opinion and experience existed with respect to several of the points which these authorities considered as demonstrative of their bacterial nature. He had been unable to demonstrate flagella in either organism but had observed the structure which Schaudinn considered to be an undulating membrane in the spirochæta of relapsing fever. A microscopical demonstration was given of the living organisms and stained specimens were shown of the different varieties both in human and in animal blood. The so-called undulating membrane was also shown in the case of a monkey spirochæta and of spirochæta Obermeieri.

Major H. W. GRATTAN, R.A.M.C., read a paper on Blackwater Fever in Sierra Leone. In eight out of ten cases quinine had been taken before the onset of "black water." Malarial parasites were present in the peripheral blood of 36 per cent. of cases after the onset of hæmoglobinuria. 50 per cent. of the cases harboured the ankylostomum duodenale. The red cells fell to 1,107,000 per cubic millimetre and the hæmoglobin to 25 per cent. in the most severe case that recovered. In two fatal cases 28 per cent. and 20 per cent. of hæmoglobin were noted. An absolute polynuclear leucocytosis was noted at the onset of the disease and later when suppression of urine occurred. 13,800 leucocytes per cubic millimetre was the highest count noted; this with 84 per cent. of polynuclears gave 11,592 polynuclears per cubic millimetre. No malarial parasites or pigment were found in the organs post mortem. He considered that the evidence pointed to the disease being of malarial origin. His reasons were: (1) a previous history of malaria in every case; and (2) the presence of a malarial parasite in the blood of 36 per cent. of cases; and, further, he was of opinion that the disease was due to a special form of malarial parasite allied to, but distinct from, the parasite of malignant tertian. Specimens of blood films containing parasites were shown and charts illustrating the destruction and regeneration of the hæmoglobin and red cells.

Major W. S. HARRISON, R.A.M.C., showed a Bacillus resembling the Diphtheria Bacillus microscopically. It was isolated from an old case of chronic suppuration of the middle ear and was found in practically pure culture in the discharge. The organism stained by Gram, showed metachromatic granules when stained by Neisser's method, produced involution forms very like diphtheria bacilli in agar, and produced acid in broth. It differed from diphtheria in its culture reactions, the growth on serum being thick and creamy, and on agar it gave a thick opaque yellow growth, the agar being gradually coloured brown and eventually becoming dark chocolate.

Major HARRISON also showed a Typhoid Bacillus isolated from a sinus, following a post-typhoid abscess, a year after the attack of typhoid fever. It was extremely involuted, forming long strings similar to the cultures of typhoid bacilli on malachite green media; it gave, however, all the cultural characters of typhoid bacilli and was agglutinated by an anti-typhoid serum. The patient's serum agglutinated other strains of typhoid bacilli in 1 in 200 to 1 in 400 and his own strain in 1 in 1000; the phagocytic ratio of the patient's serum was from two to four times greater than normal for other strains of typhoid bacilli and as much as 46 times greater than normal for his own strain, and his last high figure was probably accounted for by the fact that the bacillus isolated from the patient was very resistant to phagocytosis in mixtures containing normal serum only. Major Harrison found it difficult to account for the persistence of the organism in the body of a patient whose blood fluids showed such a high phagocytic ratio for typhoid bacilli.

LIVERPOOL MEDICAL INSTITUTION.

Nephrectomy for Renal Sarcoma in Children.—Plexiform Neuroma.—Variations in the "Normal Temperature."—A New Astigmometer.—The Surgery of Warfare and Catastrophe.

A MEETING of this society was held on March 14th, Mr. FRANK T. PAUL, the President, being in the chair.

Mr. K. W. MONSARRAT read a paper on two cases of Nephrectomy for Renal Sarcoma in Children with remarks on the Pathology and the Recent Results of Surgical Treatment. The first case was that of a boy, aged three years, the signs of disease being hæmaturia and abdominal tumour. The growth removed weighed 2 pounds 6 ounces. The child recovered from the operation but died from recurrence in six months. The growth was a sarcoma containing tubules and striated muscle fibres. The second case was that of a boy, aged five years, with abdominal tumour and hæmaturia. The child recovered from the operation and remained well at the end of six months. The growth weighed 2 pounds 2 ounces and was a pure round-celled sarcoma. Mr. Monsarrat found that published records indicated the occurrence of hæmaturia in about a third of the cases. He presented a statistical study of 104 cases published between the years 1897 and 1905 inclusive. These records showed that the present mortality from operation was 26 per cent. and that to the number of complete recoveries a total of seven had been added during the years examined. He considered that operation was justifiable in cases which showed no evidence of metastasis.—The PRESIDENT, Dr. N. PERCY MARSH, Mr. R. W. MURRAY, and Mr. A. STOOKES discussed the paper.

Mr. G. G. HAMILTON showed a patient from whom he had removed a large Plexiform Neuroma. There were about 62 cases on record. In this case the tumour grew from the ilio-hypogastric nerve and was incorporated with the neighbouring muscle. It measured 10 inches by 4½ inches and showed numerous strands of nerve thickened to the size of a toothpick, many of them being coiled up into little capsules. There were very few axis cylinders present, the whole nerve being simply a mass of thickened gelatinous endoneurium. Mr. Hamilton's communication was illustrated by several lantern slides.—The pathology of the condition was discussed by Dr. E. E. GLYNN.

Dr. W. CARTER read a short note on Variations in the "Normal Temperature." After recalling the facts that Ogle and Liebermeister had recorded fluctuations varying from 1·8° to 2·3° F. in 24 hours and that Dr. Finlayson had observed that aged people in the Glasgow workhouse infirmary who died without any definite disease generally sank at the hour when in normal health the body temperature was lowest, he stated that on two occasions at distant intervals he had been able by the coöperation of the matron and night nurses of the Royal Southern Hospital to see if an inversion of the ordinary periods of night and day duty affected the normal rise and fall. Each nurse towards the end of her period of three months' night duty took her temperature three-hourly when not asleep in the day, but, as the charts, which were shown, proved, the normal depression which took place under ordinary conditions of life at about 3 A.M. remained fairly constant even after three months of turning night into day and *vice versâ*. It seemed, therefore, to be deeply impressed on the organism and independent of external circumstances, so far, at least, as the trial of three months tended to establish the fact.

Dr. K. A. GROSSMANN explained the mechanism of his Astigmometer and demonstrated a working model.

Mr. ARTHUR J. EVANS in an interesting lecture on the Surgery of Warfare and Catastrophe, illustrated by

numerous lantern-slides from photographs and radiographs taken during the Boer War and after the earthquake in Jamaica, drew attention to the great contrast between the conditions under which surgery was practised in modern wars and those which obtained in sudden catastrophes such as an earthquake. In the one every contingency was attempted to be foreseen and provided for and the organisation was perfect beforehand; while, in the other, all aid had to be organised under the most appalling conditions and literally without a moment's notice.—The PRESIDENT proposed a vote of thanks to Mr. Evans for his lecture and of congratulation upon his escape from the earthquake and the great services which he had been able to render to the injured.—The vote was carried with very hearty cheers.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

The Prognosis and Treatment of Lobar Pneumonia.—Use of the Opsonic Index in the Diagnosis of Tuberculosis.

A MEETING of this society was held on March 6th, the chairman being at first Dr. BYROM BRAMWELL and then Dr. J. O. AFFLECK, the President.

The PRESIDENT communicated a paper entitled "Clinical Observations and Experiences in the Prognosis and Treatment of Lobar Pneumonia." If it were asked which of the acute diseases possessed the greatest interest for the physician, the answer would undoubtedly be, pneumonia. It could scarcely be answered satisfactorily as to the alleged increase in pneumonia as a disease as there were no direct means of determining its actual incidence in large communities. The Registrar-General's reports did not afford any definite information upon this point. The United States Census Reports for 1900 gave 106·1 deaths from pneumonia per 1000 deaths, against 90·6 in 1890 and 83·3 in 1880. More might be said on the question as to whether pneumonia had assumed a graver aspect of recent years. The President believed that this had been a more serious disease during the past 15 or 16 years than it had been previously. During the later "sixties" of last century his teachers did not regard pneumonia with the anxiety with which it was now the case and Hughes Bennett was wont to exhibit a list of over 100 uncomplicated cases without a death as due to his plan of treatment—viz., no drugs but feeding the patient. During the earlier years of the President's practice patients contracted the disease in a mild form and made good recoveries. When influenza appeared in 1890 pneumonia was one of the most serious of its complications. He felt sure that not a few cases of pneumonia were ushered in by influenza and thus the patient might suffer from the action of a double toxin. If this were so it would not be surprising that pneumonia should have assumed a severer form than was formerly the case. There was no means of foretelling at the beginning how the case would terminate and there were few diseases more treacherous in their liability to deviate from the normal course. In prognosis age was an important factor; excluding infants in whom the death-rate was very high, in the young and middle-aged uncomplicated cases might be expected to run a favourable course. In persons over 60 and especially over 70 years of age the mortality-rate was probably not less but more than 50 per cent. no matter what the previous health might have been. Habits, particularly the alcoholic, might outweigh the advantage of youth and vigor and might precipitate a fatal result. In the Royal Infirmary of Edinburgh in 1899–1900, of 19 cases of alcoholic pneumonia, 17 died; in 1900–01, of five alcoholic pneumonias, all died; in 1901–02, of 22 such cases, 18 died. Pneumonia occurring in the course of chronic maladies was of grave import, as it was also in acute infectious disease; where it followed surgical operations, though it might be grave, it was not always fatal. Pneumonia occurring during the acute forms of insanity was of grave prognosis. In some cases the patient might be overwhelmed by toxæmia from the first and might die in two or three days. Cases which exhibited prominent gastric and abdominal symptoms simulating some visceral lesion often turned out severe. Such cases had been mistaken for appendicitis. When pleuritic pain existed to any extent the prognosis was grave. Cases with copious perspiration and high temperature were serious from the great prostration. Nervous symptoms at the onset might obscure the diagnosis. In drunkards delirium tremens might be one of the early accompaniments of pneumonia and it was a safe rule to take the temperature and to examine the lungs carefully in every case of alcoholic delirium, for death might occur with startling suddenness in such cases. In children convulsions might be the earliest sign of pneumonia, but did not necessarily imply an evil prognosis. The ability to sleep even for short periods was of the greatest importance. Marked and persistent insomnia was a grave symptom. Cases where no sleep could be induced even by hypnotics often ran an unfavourable course. Delirium to any considerable extent usually indicated an anxious case and it mattered not whether it was of the active or low typhoid form. The temperature did not furnish a trustworthy guide in prognosis. If it continued high (105° F.) with no remissions, the cases were grave. In the aged severe and dangerous types of pneumonia might be associated with low temperatures. The main determining factor in prognosis was the condition of the heart. There was reason to believe that the pneumonia toxin was both a heart and a lung poison. Profound toxæmia might be present while the area of lung involved was very small. The toxin affected both right and left heart equally. The lethal action of the pneumonia toxin on the vaso-motor centres might precipitate a sudden or gradual heart failure. The pulse rate and character were of the greatest importance in prognosis. In favourable cases in adults the pulse-rate seldom exceeded 120, even in the height of the disease. When it reached or exceeded 140 the patient seldom recovered. In none of its features was pneumonia more likely to exhibit its treacherous features than in the pulse. In the course of a few hours a case which had seemed to be going on favourably might become alarming in the extreme by the pulse becoming rapid and small. Such cases were usually fatal very soon after this change. At other times the lowering of blood pressure was slower but progressive and the prognosis was no better. These cases resembled the heart failures in diphtheria and were as resistant to treatment. In old people the rate was less important than the character, emptiness and irregularity being unfavourable signs. A moderate amount of expectoration was probably more favourable than none. Sputum was much less common in apical than in basal pneumonia; rusty sputum was better than bloody sputum. Cessation of expectoration with increasing cyanosis was very ominous. Double pneumonia was grave but almost equally so was complete consolidation of one lung. The President briefly described the chief characteristics of a favourable crisis and any non-conformity with these must be regarded with suspicion and anxiety. A rapid fall in the temperature with a continued rapid pulse, a rise in temperature when it should fall, or any symptoms of faintness or collapse, were of grave import. Sudden death from the mere exertion of sitting up in bed had often happened and therefore very little examination of the chest should be made. They had little power to arrest the progress of such a self-limited disease. The attempt to obtain early cure or abortion by means of sera had not as yet been encouraging. Attempts by depletion, &c., were of doubtful efficacy. The physician's work lay in guiding the case and in dealing with the symptoms which called for special treatment. The President's injunction to himself was, "Beware of meddling too much." The troublesome pleuritic pain might often be relieved by a hypodermic injection of from one-sixth to one-eighth of a grain of morphine. In hospital cases more than half of the patients stated that the application of the ice-bag to the painful side afforded relief; a certain number, however, could not bear it and wished it removed. It seemed most suitable in the young and vigorous and never seemed to have led to any increase in the pneumonic area. Warmth was, as a rule, well borne, but great heat was unnecessary and might aggravate the patient's discomfort. A moderately warm poultice often gave relief. The gamgee tissue jacket was all that was necessary in cases with no pain. Cough if troublesome often required treatment; dyspnœa was often of evil omen. The President's experience with oxygen inhalation had not been small but was disappointing. An ample supply of fresh air was always desirable. When the heart showed signs of failure digitalis, strophanthus, strychnine, and alcohol were useful remedies. Digitalis and strychnine were the most powerful in his hands and alcohol was inferior to strychnine as a stimulant. For insomnia paraldehyde given by the mouth or rectum was one of the best hypnotics. Opium in any form or dose he shrank from administering in the

advancing or advanced stage of a pneumonia. Delirium might be treated by an ice-bag to the head and hyoscine was also useful. The pyrexia might be reduced by sponging such parts of the body as were easily reached but antipyretic drugs were not advisable from their heart-depressing tendency.—Dr. BRAMWELL could never reconcile Hughes Bennett's results as he had always found the disease one associated with a high mortality. He was certain that an antidotal serum would be found. He had seen cases of pneumonia mistaken for abdominal disease, as gastric ulcer, and even operated upon. He thought that jaundice in cases of right-sided pneumonia was very unfavourable. Dr. Bramwell did not take so serious a view of a rapid pulse-rate (140) as the President. Irregularity of the pulse was of greater significance. Copious saffron-coloured sputum in influenzal pneumonia was very grave. The expression of the patient was of great value in prognosis. Dr. Bramwell prescribed very little alcohol, but thought that digitalis, strychnine, and oxygen inhalations were of great value and he would wish to treat such patients by the open-air method. —Professor W. S. GREENFIELD said that in above 70 per cent. of cases vomiting at the onset was a feature. As regards treatment he had found that digitalis often produced toxic symptoms and he had never seen any good results from strychnine and his only fatal cases had occurred under its use. It was in no sense a cardiac tonic. In all cases where the heart was failing he used strophanthus. The ordinary tincture was useless and that of the pharmacopœia of 1885 had always to be prescribed. He employed five minims of this tincture with five minims of tincture of capsicum every three or four hours; then it might be increased to ten minims or even to 15 minims every half hour. Massive doses might be given even in apparently hopeless cases. Even in cases with a leucocyte count of from 3000 to 4000 improvement had resulted from such treatment.—Dr. ALEXANDER JAMES thought that the eruption of herpes was always a very favourable sign in prognosis. He was in the habit of giving a purge at the beginning of the disease and thought it valuable. He employed the ice-bag for the relief of the pleurisy and at the time of the crisis he found mistura moschi very helpful.—Dr. G. LOVELL GULLAND said that the pneumococcus was found very often in the blood in fatal or in complicated cases. Leucocytosis was present in pneumonia, but in very severe cases there might be neither increase nor decrease, as might also happen in very mild cases. The case might be apparently going on well, but if the leucocyte count went on diminishing it was likely to prove fatal. The number of leucocytes should fall within one or two days after the crisis and if it did not then it pointed to serious symptoms. Cases where the eosinophiles persisted even in small amount were likely to do well.—Dr. WILLIAM RUSSELL said that the main factor in treatment was the maintenance of the heart's action. Strychnine acted on the vaso-motor centre and so improved the tone of the vessels. He appealed to Professor Greenfield to bring his experience and views more formally and fully before the society.—Dr. ALEXANDER GOODALL stated that he had been investigating the raw strophanthus on the market for one of the manufacturing chemists and he had been surprised at the difference—some specimens had no more effect than so much water, while others were very potent and highly toxic.—Dr. W. E. CARNEGIE DICKSON and Professor H. HARVEY LITTLEJOHN took part in the discussion, and the PRESIDENT replied.

Dr. IAN STRUTHERS STEWART and Mr. L. C. PEEL RITCHIE communicated a Note on the Use of the Opsonic Index in the Diagnosis of Tuberculosis. In all forms of the disease early diagnosis was essential to successful treatment. Frequently, however, diagnosis was uncertain because of the indefiniteness of the early physical signs. The method which they submitted and at which they had been working for some time was one which rendered possible a diagnosis of tubercle even when the signs and symptoms were not conclusive. It consisted in the injection of a minute dose of tuberculin R. in conjunction with the observation of the tuberculo-opsonic index of the blood before and after inoculation. The conclusions were based on observations made on 122 consecutive cases of medical and surgical tuberculosis. The cases were divided as follows: 1. Those in which there was reasonable ground for diagnosing tuberculosis. In many diagnosis was based on pathological proof (examination of discharges, operation, &c.), and in the remainder by continued clinical observation. 2. Either normal cases or those suffering from diseases other than tuberculosis. Several observers had shown that the tuberculo-opsonic index varied slightly in health. The normal limits of variation were from 0·8 to 1·2. The first group (tuberculosis) consisted of 82 cases. The indices of 41 fell within the normal limits and 41 outside. In the second group there were 40 non-tuberculous cases, of which 29 were within and 11 outside the normal limits. A diagnosis based on one examination of the tuberculo-opsonic index would have resulted in an error of diagnosis in one half the number. In the non-tuberculous cases 27·5 per cent. were outside the normal limits and a reliance on this test would have led to error to this extent. In acute tuberculous cases the swinging index might also lead to error in diagnosis. In a paper in conjunction with Dr. D. Lawson of Banchory it had been shown that if a small quantity of tuberculin R. were injected into a tuberculous patient there was a diminution in the index but the reverse occurred in a healthy case. The method employed was as follows. The patient's blood was taken on the first day. Tuberculin was injected and the index estimated for the first and two succeeding days. The index of 1·0 was obtained from an examination of the blood of two healthy people. The bacilli ingested by at least 120 polymorphonuclear leucocytes were counted. The most suitable dose of tuberculin was $\frac{1}{500}$th milligramme for adults and $\frac{1}{1000}$th milligramme for children. The depth of the negative phase was generally less where the primary index was low than where the primary index was high in an infected person. The usual fall in a tuberculous patient was 0·2. In 62 tuberculous patients inoculated a negative phase was observed in 56, or 90·3 per cent. In 13 cases (normal or non-tuberculous) a negative phase was not obtained after inoculation. The conclusions were: (1) the opsonic index *per se* was an unsatisfactory means of diagnosis, as both tuberculous and non-tuberculous cases fell within and without normal limits; (2) if a negative phase appeared after inoculation the existence of tuberculosis might be diagnosed; and (3) the absence of a negative phase indicated the absence of a tuberculous infection.—Dr. LAWSON (Banchory), Dr. GULLAND, Mr. HAROLD J. STILES, and Mr RITCHIE took part in the discussion which followed.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

Maniacal Chorea.—Moveable Spleen.

A MEETING of the Section of Medicine was held on March 1st, Dr. JOSEPH M. REDMOND, the President of the section, being in the chair.

The PRESIDENT of the Academy (Dr. J. MAGEE FINNY) read a paper on Maniacal Chorea, basing it on the clinical report of a case which had lasted nine days from the onset of the chorea and which had been preceded by an attack of rheumatism of a fortnight's duration. The patient, a girl, aged 17 years, was admitted to Sir Patrick Dun's Hospital, Dublin, on June 14th, 1906, with chorea minor, and presented a distinct systolic apical murmur. This murmur was audible up to her death and was considered to be due to organic disease of the mitral valve. On the day following her admission the choreic movements became very violent. With the access of these movements maniacal symptoms set in and so greatly did they overshadow the motorial disturbance that the house surgeon believed the case to be one of acute mania. The temperature was not raised for five days, but on the sixth day it reached 103·4° F. for a few hours and the pulse-rate rose from 80 to 130 on the day of her death. Dr. Finny said that he never saw a human being so tossed about and agitated in every limb as this girl. The skin of her lips, back, arms, and legs was rubbed off from the violence and suddenness of the movements, as no appliances of wadding, bandages, and stockings could be kept on; and at times it required from four to eight persons to restrain her in bed. Calm was obtained—but very temporarily—by chloral, inhalation of chloroform, and the hypodermic administration of hyoscin hydrobromate in doses of $\frac{1}{100}$th or $\frac{1}{150}$th of a grain. Death was preceded by semi-coma of from six to eight hours' duration. All through the illness (except for the last day or two) intelligence was retained and she could occasionally answer a question in a few words. At the necropsy the brain showed very little gross alteration beyond engorgement of the vessels of the cortex and there was an absence of meningeal inflammation

of the brain or cord. On microscopic examination some small vessels of the cortex in the Rolandic area were found to be thrombosed; in others collections of cells with oval nuclei lay heaped up in the perivascular lymphatic spaces. The spinal cord presented nothing abnormal. The cerebro-spinal fluid was examined bacteriologically for Wassermann's coccus (diplococcus rheumaticus), but with negative results. The cultures remained sterile. No other organ presented any abnormality except the heart, which was small and in an atrophied condition. The mitral and other valves were not inflamed. Dr. Finny called attention to the agreement between the clinical inference that rheumatism and chorea were due to the same poison and the recent bacteriological work of Poynton and Holmes, which demonstrated that the diplococcus of rheumatism was present in the brain and membranes of the cord, as well as in the fringe of vegetation around the mitral orifice and in the mitral valve itself—so commonly found in chorea and in rheumatism. Thus the same micro-organism has been found in various organs—brain, spinal cord, and heart. This organism, termed the diplococcus rheumaticus, has been found in rheumatism and in chorea and according as the toxin produced by it attacked the psychical or the motorial centres of the human subject, so the case would be characterised by great mental disturbance (mania) or by violent choreic muscular movements or both.

Dr. J. CRAIG said that chorea was now described rightly as a specific fever. There was always a certain amount of acute dilatation of the heart in the early stage, with a cardiac murmur that would subsequently disappear. Chorea was merely a complication or manifestation of the rheumatic state. As regards treatment he had modified his belief in the administration of large doses of arsenic.

Dr. THOMAS G. MOORHEAD read an account of a case of Moveable Spleen.

BRITISH GYNÆCOLOGICAL SOCIETY.—A meeting of this society was held on March 14th, Mr. W. D. Spanton, the President, being in the chair.—The President showed a specimen of Sarcoma of the Parovarium removed from a patient, aged 42 years, who had been married 16 years, had two children, and one miscarriage 12 years ago. Her health was good until five years ago when she had neuritis of the limbs and head. On opening the abdomen a parovarian cyst was found in the left mesosalpinx. The cyst wall was extensively infiltrated with spindle-celled sarcomatous growth probably of endothelial origin. The growth was removed and the patient made a good recovery.—The President also showed a specimen of large Uterine Myoma with Sarcomatous Outgrowth, removed by abdominal hysterectomy from a widow, aged 49 years. Convalescence was satisfactory.—Dr. J. A. Mansell Moullin exhibited a Fibroid Uterus containing a fœtus of four months removed from a patient, aged 26 years, who was pregnant for the first time and complained of great abdominal pain and tenderness. Examination suggested ectopic gestation. When the abdomen was opened a cervical fibroid was found which would probably have interfered with delivery at term.—Dr. H. M. Macnaughton-Jones showed a specimen of carcinoma of the vagina from a patient who afterwards developed carcinoma of the ovary.—Mr. F. Bowreman Jessett exhibited a specimen of Carcinoma of the Ovary involving the sigmoid flexure removed from a patient, aged 48 years, who complained of a vaginal discharge which occurred irregularly, being sometimes sanguineous and at other times watery. She was a healthy-looking, well-nourished, active woman. No abnormality was discovered on abdominal examination, but by the vagina the cervix was found to be eroded and thickened, and bimanually a small tumour was found connected with the posterior surface of the uterus which was enlarged but quite mobile. As the discharge seemed to come from the erosion local treatment was recommended with good result. 15 months afterwards an abdominal tumour was discovered extending nearly to the umbilicus and somewhat fixed. This was connected with a tumour in the pouch of Douglas closely attached to the posterior surface of the uterus. Operation was advised and on opening the abdomen a large tumour presented itself with numerous adhesions to intestines and omentum. After separating these the tumour was found to be so closely adherent to the sigmoid flexure that it was necessary to resect the portion of intestine involved. Convalescence was complicated by tympanites and constipation which required reopening of the wound. In 14 days the temperature rose and pain became severe. These symptoms were followed in a few days by a fæcal fistula at the lower angle of the wound. The fistula closed in a few weeks and the patient progressed satisfactorily. The growth proved to be an alveolar carcinoma.—Mr. E. Stanmore Bishop read a paper entitled "Mobile Kidney with a Description of an Operation for Anterior Nephropexy." The only form of importance was the wandering kidney. Two stages existed, the first being one of descent and the second that of loosening of the ureteral attachment to the spine. As the result of the first there was bending of the ureter and subsequently stagnant urine, then kinking of vessels and dragging of the duodenum and biliary ducts. The results of the second stage on the left side were traction on the pericardium through the diaphragm with anginal attacks, constipation and sapræmia, followed by hysteria and neurasthenia. The objections to the posterior methods of operating were stated. In any further method the kidney should be supported from below and be placed at a proper height. Through a transverse incision in front the liver was raised and the hepatic flexure was depressed. The kidney was pushed up to its proper level. A transverse incision was made through the peritoneum and the capsule was cut through in a curved line which was then turned down and the edge fixed. The peritoneum was then replaced and sewn up. An incision was made through the skin and tissues posteriorly over the lumbar muscles. Fixation sutures of chromic or iodised gut were passed through the kidney from the front, with due regard to vessels and nerves, to the posterior incision, and were there tied, after which both wounds were closed. This operation had been performed ten times with satisfactory results in all but the first case, where the capsule was not utilised.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.—A meeting of this society was held at Sheffield on March 15th, Dr. Edward O. Croft, the President, being in the chair.—Dr. Archibald W. Cuff (Sheffield) described a case of Ruptured Isthmial Ectopic Gestation. The patient, who was 34 years of age and had been four times pregnant, had two miscarriages each at about the fifth month. Menstruation was regular up to the last period which was a week late. After an interval of 30 days she was suddenly seized with intense pain in the lower abdomen which rapidly became worse. There was considerable collapse, the pulse-rate was 120, the temperature was subnormal, and respiration was sighing. Abdominal section was performed within six hours of the onset of the first symptom. The abdomen contained free blood and the isthmus of the right Fallopian tube was found to be the seat of an early gestation which had ruptured.—Dr. Cuff also related a case of Uterine Fibroid in a woman, 35 years of age, and four months pregnant, who suffered from abdominal pain and constant vomiting. Her temperature was 101° F., her pulse-rate was 120, and she looked very ill. The size of the abdominal swelling exceeded that of a four months pregnancy and on the left side a hard, excessively tender swelling could be felt. It could be moved independently of the uterus and this together with the fact that it had rapidly increased in size pointed to its being a solid ovarian tumour with a twisted pedicle. Abdominal section revealed a uterine fibroid of the size of a fœtal head springing posteriorly from the left cornu of the uterus. Enucleation was performed and a second and smaller fibroid was removed. Superficial and deep sutures were used to close the uterine incision and the abdominal wall was sutured in three layers. There was no interference with the progress of the pregnancy.—Dr. John E. Gemmell (Liverpool) read notes of a case of Early Carcinoma of the Cervix Uteri treated by Abdominal Hysterectomy and Pelvic Dissection. Five years previously he had operated on the patient for an adenomatous ovarian cyst on the left side and hydrosalpinx on the right side. She remained in good health until the summer of 1906, when she began to have pain in the left leg and thigh. On admission to a hospital in January, 1907, there was marked œdema of the left leg. Per vaginam the uterus was found to be as large as in the third month of pregnancy, of soft solid consistence and fixed; the cervix was hard and irregular and bled easily. Early epithelioma of the cervix was diagnosed with fibroid of the uterus.

Abdominal hysterectomy was performed with some difficulty occasioned by the shortness of the broad ligaments resulting from the previous operation and the presence of enlarged pelvic glands which were only recognised on opening the abdomen. The pelvic glands were removed, those in the obturator canal forming a mass two inches long and half an inch broad. Sections of the cervix showed early adeno-carcinoma, some of the acini being free from infiltration. There was definite carcinoma in the obturator and pelvic glands. The uterus contained pus and sections of its wall showed round-celled infiltration with destruction of the endometrium. The patient made a good recovery. The case showed that an extensive infiltration might take place in the pelvic glands with very early disease of the cervix.—Dr. Alexander Stookes (Liverpool) mentioned a case of Single Condyloma of the Cervix in a patient five months pregnant. There was no other evidence of syphilis except pigmentation of the thighs.—Dr. Arthur J. Wallace (Liverpool) made a short communication on a Modification in the Technique of Ventrofixation of the Uterus. The subsequent occurrence of intestinal obstruction in a patient on whom he had performed ventrofixation as well as recorded cases of a similar accident in the practice of some other operators led him to modify his procedure in the technique of the operation. He had noticed that when occasion arose for opening the abdomen of patients who had previously been subjected to this operation a window existed in the utero-vesical pouch below the suspended uterine body. This space would sometimes admit four fingers and through it a loop of bowel could readily pass. To obviate this a complete peritoneal diaphragm was formed from the vesical and utero-vesical peritoneum before suspending the body of the uterus.

HUNTERIAN SOCIETY.—A meeting of this society was held on March 13th, Mr. John Poland, the President, being in the chair.—Dr. George Carpenter read a paper on Nephritis in Infants. According to some American authors albuminuria with passage of casts was common in infants, especially during the course of gastro-intestinal disorders. In Dr. Carpenter's own experience, however, albuminuria in infants was rare; he found it in only two out of 62 cases in the out-patient room. In both these cases there was a marked diminution in the amount of chlorides in the urine. Cases of nephritis undoubtedly occurred in infants, with the usual signs and symptoms. The disease might begin during intra-uterine life. Syphilis played some part in the etiology; there was retarded development of the kidneys in congenital syphilis. Some other toxins might also be a cause of the disease. An important point to remember was that in infantile nephritis, whether of syphilitic origin or not, the kidneys might appear to be normal to the naked eye.—Dr. David B. Lees read a paper on the Administration of Salicylates. He considered that sodium salicylate was as directly antagonistic to acute rheumatism as was mercury to syphilis or quinine to malaria. The drug was often given in doses which were really quite inadequate, because it sometimes caused unpleasant symptoms, and also because there was a prevalent idea that salicylates acted as cardiac depressants. As regards the unpleasant symptoms, the occurrence of which, except vomiting, was rare in children, omission of two or three doses usually lead to their disappearance. Dr. Lees always gave double doses of sodium bicarbonate—e.g., ten grains of bicarbonate of sodium with five grains of salicylate of sodium, which was *not* a cardiac depressant. The dose should be increased daily or every second day until the maximum was reached. In adults this might be 450 grains in 24 hours. One of Dr. Lees's patients, a boy, aged 15 years, took 600 grains in 24 hours, and then 500 grains six days a week for three weeks. There was no need to discontinue the drug during an attack of pericarditis. If sodium salicylate was given without sodium bicarbonate a condition of acid intoxication very much resembling diabetic coma might be produced. This condition might also be produced by aceto-salicylic acid. In chorea small doses of sodium salicylate were not much good; the dose should be from 200 to 300 grains per diem. Aceto-salicylic acid was especially useful in chronic cases. The objection to this drug was that it could not be given with an alkali.—Mr. Harold L. Barnard read a paper on Intussusception, based on an analysis of 187 cases operated on at the London Hospital. 135 occurred in babies under one year old, 165 under ten years of age. Only four cases occurred in infants under the age of three months. 131 patients were male and 56 were female. He considered that two factors of great importance in the etiology were lack of nervous control of the ileo-colic sphincter and hypertrophy of the lymphatic nodules of the lower end of the ileum. Prolapse of the mucous membrane of the ileum through the ileo-colic sphincter might occur, like prolapse of the rectal mucous membrane through the anus, and act as the starting-point of the intussusception. The diagnosis was usually easy, but colitis might simulate intussusception and *vice versâ*. The best treatment was immediate operation, though according to Mr. McAdam Eccles's statistics the results of injection were just as good.—Mr. Douglas Drew, Mr. Hugh M. Rigby, Mr. Hugh Lett, and Mr. Hugh Davies discussed the paper. They were none of them willing to accept Mr. Barnard's theory of the causation of intussusception as explaining all cases, as cases in which the caput coli formed the apex of the intussusception were not uncommon. They were all of opinion that preliminary injection or inflation was useless, as although these methods of treatment often effected partial reduction they did not effect complete reduction.

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.—A meeting of this society was held on March 8th, Dr. D. S. Davies, the President, being in the chair.—Dr. J. E. O'Connor, barrister-at-law, read a paper upon Combined Sanitary Districts. He said that the chaotic and disorganised state of the sanitary medical service had long since become a by-word and that by its improvement the public, and especially the poor, would be greatly benefited. With a view to securing such improvements he recommended the giving of power to the Local Government Board compulsorily to combine sanitary areas for the purpose of appointing a joint medical officer of health; the non-lapsing of appointments of medical officers of health with supervision of their salaries by the Local Government Board; the payment of official expenses such as the cost of travelling from one part of a district to another; and the provision of clerical assistance. At the present time combined districts appointing whole-time medical officers of health embrace about one-sixth of the area of the country. In Dr. O'Connor's opinion efficiency in rural sanitary administration would be most easily and effectively obtained by combining the remainder of the lesser urban and rural districts. He considered that there was no need for the sweeping alterations in local government recommended in the recent report of the Select Committee on the Housing of the Working Classes—alterations which, apart from the widespread dissatisfaction which they would engender in the precise class that they were intended to benefit, were open to many administrative objections. If the committee had obtained evidence from the members of the Society of Medical Officers of Health who were engaged in the administration of the Public Health Acts in country districts it would have learned that the necessity for administrative improvement was even greater in the small urban districts which it left untouched than in the rural districts which it would extinguish. If it had had before it evidence as to the disabilities under which even the medical officers of combined districts suffered it might have spared its censure on officials who were the victims of inept legislation and might have directed more attention to the indifference of successive Governments to the administrative supervision of the public health. He did not consider that the county was a suitable unit for the apportionment of duties among medical officers of health but advocated the formation of more or less arbitrary combined districts of about 500 square miles in area and with a population of about 100,000. A district of this size he considered could be supervised by one medical officer of health provided he was given suitable clerical assistance.—Mr. Herbert Jones said that the medical inspectors of the Local Government Board, when advising a combination of sanitary districts, were in the habit of stating that the services of a "young and active medical officer of health could be secured at a salary of £500 per annum." This salary would, however, in reality be reduced by official expenses to less than £400.—Mr. W. Gruggen stated that a large district in Hertfordshire had become disintegrated through rural areas becoming urban districts and a local medical officer of health had been appointed.

MANCHESTER MEDICAL SOCIETY.—A meeting of this society was held on March 6th, Dr. S. Moritz, the President, being in the chair.—Dr. Moritz delivered his presidential address on the Diagnosis of Pulmonary Tuberculosis in its Earlier Stages. He pointed out that though

the finding of tubercle bacilli in the sputum made the diagnosis of pulmonary tuberculosis absolutely certain, the diagnosis often had to be made when tubercle bacilli were not found, for there might be no sputum, or it might contain no bacilli or show them only at intervals, this latter condition being of frequent occurrence. Iodide of potassium and a wet pack sometimes promoted the expectoration of characteristic sputa. The serum diagnosis of Arloing and Courmont gave in 12 per cent. of tuberculous cases a negative, and in 33 per cent. of clinically non-tuberculous cases a positive, reaction. Injections of tuberculin were not always free from danger and a positive reaction only proved the presence of a tuberculous focus somewhere, which focus might moreover be active or latent. The President then gave the particulars and the results so far obtained by opsonin testing at the Delamere Sanatorium. These led him to the conclusion that the opsonic index formed no trustworthy diagnostic sign for pulmonary tuberculosis as it might be normal, high, or low. French's sign also was of no help; after small injections of tuberculin, namely, there need not be a long-lasting negative phase in the phthisical, as this negative phase was occasionally absent and frequently found of short duration. The President concluded that the diagnosis of early pulmonary tuberculosis must still be made not by bacteriological methods but by the consideration of the symptoms and physical signs. He reviewed the former, laying special emphasis on the significance of persistent rises of temperature, hæmoptysis, digestive troubles, &c. In regard to the last he recommended careful percussion and auscultation over the posterior apices of the lung after the patient had been at rest and before he had been made to breathe deeply, as only in this way some abnormalities in the sounds due to temporary obstruction of a bronchus could be heard, which sounds disappeared after several deep inspirations. He further reviewed the significance of other physical signs, as well as the results of Roentgen ray examination.—Mr. J. E. Platt related the case of a man, aged 60 years, in whom he had performed the operation of gastro-jejunostomy for a carcinoma of the pylorus causing marked obstruction. On the fourth day after operation the left submaxillary gland had become swollen and painful and on the sixth day the left parotid gland also. A few days later the glands were incised and considerable quantities of pus were evacuated. After the operation the patient had been greatly distressed by an extremely dry condition of the mouth. The abdominal wound had healed by primary union, and with the exception of the suppuration in the salivary glands the patient had made a good recovery and had had relief from his symptoms for many months after the operation. The pathology of the condition was discussed, and it was pointed out that the suppuration was the result of a septic condition of the mouth and deficient secretion of saliva allowing organisms to travel upwards along the ducts of the salivary glands. In the majority of cases the suppuration had been preceded by a very dry condition of the mouth, and in many cases the patient had been fed for some time by nutrient enemata. The comparative rarity of this affection in the submaxillary gland was referred to.

BRITISH LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL ASSOCIATION.—A meeting of this society was held on March 8th, Mr. Mayo Collier, Vice-President, being in the chair.—Dr. P. H. Abercrombie showed a case of a male, aged 64 years, in whom he had performed Thyrotomy for the removal of Epithelioma of the Right Vocal Cord. The suspicions aroused by the clinical appearances had been made certainties on examination by Dr. V. H. Wyatt Wingrave of a piece of the growth removed by Dundas Grant's laryngeal forceps. Operating at an early stage the exhibitor had been able to excise the growth thoroughly.—Dr. Abercrombie also showed another case in which he had performed Thyrotomy two years ago for Epithelioma of the Left Vocal Cord and in which no recurrence had taken place. In both operations he had performed a preliminary tracheotomy and had inserted into the trachea a Hahn's cannula.—Dr Abercrombie likewise showed a case of "Tuberculoid" Disease of the Left Tonsil in a woman, aged 67 years. The patient went to hospital complaining of sore throat confined to the left side, of about two months' duration. On inspection the left tonsil was seen to be enlarged and covered with a whitish exudation and at its upper border extending on to the palate was a nodular, ulcerated area. The left side of the palate, the epiglottis, the left arytenoid, and the left ventricular band were congested and œdematous. The glands at the left angle of the jaw were enlarged and tender. The first explanation of these appearances was that the disease was either tertiary syphilis or malignant disease. The microscopic findings, however, showed, in the opinion of Dr. Wyatt Wingrave, that the tonsil was the seat of granulomatous deposit of the tuberculous type. No tubercle bacilli were found in the tissue.—Mr. Mayo Collier showed a case of Laryngeal Tuberculosis in a male the subject of long-standing tuberculous disease in the lungs and ribs.—Mr. W. J. Chichele Nourse showed a case of Tuberculous Disease of the Larynx in which enormous swelling of the left arytenoid region existed.—Mr. Mayo Collier thought that these cases should be treated by tracheotomy in order to give the larynx rest and time to recover from the severe inflammatory reaction, otherwise the condition would go on from bad to worse until the tumefaction and pain would effectually prevent swallowing, when the patient would rapidly sink from inanition.—Mr. H. S. Barwell and Mr. J. Bark could not agree with Mr. Mayo Collier in his advice. Their experience of tracheotomy had been very discouraging. They preferred to remove the tuberculomata with punch forceps if the necessity for interference arose.—Dr. Andrew Wylie showed a case of Paralysis of the Left Vocal Cord of Four Years' Duration in a young man due to pressure on the left recurrent laryngeal nerve by large masses of enlarged lymphatic glands in the root of the neck.—Dr. Patrick Dempsey and Dr. S. Horace Law considered the glands in Dr. Wylie's case to be the seat of tuberculous disease.—Dr. D. McKenzie was of opinion from the long persistence, the size, the extreme hardness, and the discrete character of the glandular masses that they were of the nature of lymphadenoma.

SOUTH-WEST LONDON MEDICAL SOCIETY.—A meeting of this society was held on March 13th, Dr. M. Mackintosh, the President, being in the chair. Dr. Herbert P. Hawkins gave an address on Constipation and Dilatation of the Colon with some results of treatment. After briefly detailing the salient features of the condition formerly known as idiopathic dilatation of the colon, Dr. Hawkins showed a typical example and demonstrated the presence of the chief signs. In this case, an infant, aged six months, whose grandfather had been under Dr. Hawkins's care for the same condition and who died from it at the age of 40 years, there was a history of constipation from birth, requiring active interference at the eighth day, alternating with diarrhœa. There had been no vomiting and there seemed to be no pain. The abdomen was distended and a large loop of distended colon ending in the left iliac fossa was well marked and showed peristaltic movements. On examination per rectum the bowel fitted on the finger like a glove and no superior opening could be felt, but a stiff tube could be passed upwards through which small quantities of liquid fæcal matter had been drained away. Dr. Hawkins then showed lantern slides illustrating other cases and the anatomical and pathological features of the condition. He maintained that the adult form was of the same nature and origin as that of the child and was to be regarded as a rare and exceptionally long-lived instance of the congenital form. In no case was there an organic obstruction to be found; the dilatation and hypertrophy producing a funnel-shaped portion of colon, of which the lower end was usually in the pelvic colon, led to the supposition that the condition was due to a tight muscular contraction of the bowel in this position, or, what was an equally effective obstruction, paralysis of a segment of the bowel. Patients were, as a rule, in good health until the onset of a fatal toxæmia; it was essential that such cases should be recognised in an early stage, as operative interference might be, and had been, successful. The operation advised was short circuiting the bowel to a point below the supposed obstruction; colotomy was not a desirable measure, and the removal of the dilated colon had on some occasions been followed by a fresh dilatation.

EDINBURGH OBSTETRICAL SOCIETY.—A meeting of this society was held on March 13th, Dr. J. W. Ballantyne, the President, being in the chair.—Sir J. Halliday Croom read a paper on Exophthalmic Goitre in its Relation to Gynæcology and Obstetrics. He said that his personal experience led him to believe that there was no interdependence between Graves's disease and gross pelvic lesions. Disorders of menstruation were frequently associated with exophthalmic goitre, menorrhagia being the symptom when the disease was early and progressive, and amenorrhœa only when

the disease was far advanced and the patient exhausted. Judging from the very conflicting literature on the subject and from his own observations, he was of opinion that pregnancy had a very uncertain effect upon the course of Graves's disease, sometimes ameliorating but more often aggravating it. There was, therefore, no reason to preclude girls with exophthalmic goitre from marriage.—The paper was discussed by the President, Dr. A. H. F. Barbour, Dr. N. T. Brewis, Dr. James Ritchie, and others.—Dr. David Newman described several cases of Lesion of the Bladder, illustrating the cystoscopic appearances by the opaque projector. The first three cases were examples of sacculated bladder, in two of which the diverticulum contained a calculus. In one of them the calculus would probably have escaped observation without the assistance of the cystoscope. The mucous membrane of the bladder was practically normal. The colour, except immediately around the opening of the saccule, was pale, but the lips of the opening were deeply congested, rounded, and thickened, and in contrast to the bright red lips of the opening, the calculus was seen as a pale white object. Dr. Newman also described three cases illustrating certain causes of painful micturition in women, not usually recognised. In the first case there was at the margin of the neck of the bladder a crowd of very delicate fimbriated processes with bulbous ends extending from the margin inwards for a distance of about a third of an inch; the papillæ were pale in colour, except at the tips, where they were bright red and almost of the colour of blood. They were quite translucent and presented an œdematous appearance. The symptoms were practically those of a vesical calculus; removal of the outgrowth, which was of inflammatory origin, gave complete relief. In another case the lesions were little nodular growths not larger than a barley-corn, oval in shape, of a bright red colour, and protruding from the mucous membrane very much like the granulations in chronic pharyngitis. This lesion was frequently seen in rheumatic subjects and unless a cystoscopic examination was made the symptoms might be assigned to other causes.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on March 7th, Dr. W. C. Chaffey, the President, being in the chair.—The President showed a child, aged seven years, with a Constantly Slow Pulse, 40 to 50 beats in the minute, also an apical systolic murmur, but no dilatation of the heart. He also showed a child with Spastic Paraplegia which he considered to be due to congenital abnormality in the pyramidal tracts and not to injury at birth.—Dr. E. Hobhouse showed a case of Spastic Paraplegia (? Diplegia) in a child.—Dr. Walter Broadbent showed a man with Charcot's Disease of the Left Knee-joint, there being painless effusion, grating of the bones, and looseness of the ligaments. The patient had Argyll-Robertson pupils and no knee-jerks, but there was no ataxy.—Dr. D. G. Hall showed a similar case of Charcot's Disease of the Knee and a remarkable case of Charcot's Disease of the Right Shoulder which had come on painlessly and very rapidly in which an x ray photograph showed considerable loss of the head of the humerus; the arm could be moved into almost any position, natural or unnatural. He also showed a woman with Leontiasis Ossea of the Face and Tertiary Nodes of the Tibiæ and Right Femur.—Dr. A. J. Hutchison showed photographs and microscopic specimens from a case of Osteo-sarcoma of both Superior Maxillæ which at first simulated double antral suppuration.—Dr. Broadbent read a paper on Some Myocardial Diseases, pointing out that myocarditis was often neglected because there was no cardiac murmur. He also dealt with the physical signs of cloudy swelling, the shortening and weakening of the first sound, and the variations in different acute diseases, and laid stress on the dangers of dilatation of the stomach in these diseases.—The paper was discussed by the President, Dr. C. H. Benham, Dr. Hutchison, Dr. A. M. Daldy, Dr. H. C. Lecky, and Mr. W. D. Calvert.—Dr. Broadbent replied.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on March 1st, Dr. J. Lindsay Steven, the President, being in the chair.—Dr. J. Walker Downie read notes on Six Cases of Sarcoma of the Nose. The tumour, he thought, generally originated from the lateral masses of the ethmoid, including the middle turbinal, or in the naso-antral wall, or within the antrum. In one case only was the septum involved. The growths resembled simple mucous polypi. Epistaxis, pain during any manipulation with the tumour, and any distension and hypertrophy of the nasal bones were suspicious symptoms and called for careful microscopic examination of the tumour. Early diagnosis and thorough removal were very important. Where the tumour was entirely intranasal it should be removed by punch forceps, curettes, and the electric cautery. Where the septum was involved and the area widespread Rouge's operation should be performed.

ÆSCULAPIAN SOCIETY.—A meeting of this society was held on March 15th, Dr. J. R. T. Conner, the President, being in the chair.—Mr. C. Gordon Watson read a paper on the Treatment of Tuberculous Disease of the Knee. He said that in early cases rest should be enforced, as this checked inflammation and so prevented deformity. A moulded undressed leather splint should be worn for six months after all active symptoms had subsided. Tuberculin injections and passive congestion might be used in future in the treatment of tuberculous arthritis. Suitable hygienic conditions were most important. The following generalisations briefly expressed Mr. Watson's conclusions on the operative treatment. Mixed infection spelt doom to the joint. There were two knees worth having: the moveable, when it was stable; and the fixed, when it was straight. Erasions seldom produced either. Fibrous ankylosis spelt fixation and failure. The tubercle bacillus sometimes wrecked a child's joint; but erasion and excision were the worst offenders. In the young adult excision was very good; in the old amputation made the best of a bad job.—Dr. W. Langdon Brown read notes of a case of Frontal Cerebral Abscess and showed the specimen. He also showed a microscopic specimen of an Angio-psammoma.—Mr. W. Campbell M'Donnell read notes of a case for diagnosis.

Reviews and Notices of Books.

Judicial Statistics, England and Wales, 1905. Part I., Criminal Statistics. London: Wyman and Sons. 1907. Pp. 241. Price 2*s.*

THE volume of criminal statistics for 1905 contains the usual information relating to the movement of crime and to the judicial proceedings in criminal cases during the year in question, together with the customary returns as to coroners' inquests, reformatory and industrial schools, criminal lunatics, and habitual drunkards. The figures are arranged in the tabular form adopted on the revision of the criminal statistics in 1892. The tables are preceded by a lengthy and interesting introduction written by Sir John Macdonell, C.B., Master of the Supreme Court, who, it will be recollected, contributed a valuable introduction to the statistics for 1899. On the present occasion he has dealt exhaustively with the figures for the year under review and has also devoted special consideration to certain points of general sociological interest as to which he has been at pains to obtain supplementary information. As a result, his introduction forms one of the most remarkable studies of crime that have appeared in this country for some years.

The first question usually asked with reference to these statistics is, What do they tell us of the tendency of crime? The answer suggested by the official figures is that during the last few years crime, at least in its more serious forms, has increased absolutely and relatively to population. In 1905 the number of indictable offences reported to the police and the number of persons tried for such offences were larger than in the preceding year and considerably in excess of the average figures for the period 1901–05, and the frequency of serious crime during that quinquennial period was again considerably greater than in the five years 1896–1900. If, however, we carry the comparison back over a longer term of years we find that the general trend of movement has been decidedly downwards. Thus, while the average number of persons per 100,000 of the population tried for indictable offences in 1901–05 was 175, in 1857–60 it was 263. In this more extended survey the year 1899 is seen to

mark the extreme limit of the receding movement which was observable in serious crime during the last quarter of the nineteenth century; the first years of the present century have shown an opposite tendency, though the increase in crime is so far relatively slight. The movement of crime taken as a whole is, however, of very little real significance to the social observer; to judge of its meaning it is necessary to discriminate between the various forms of delinquency, as we can in some measure do by means of the legal classification of offences, though of course their correspondence with psychological and ethical divisions is very imperfect. When we look at the matter from this point of view we find that the increase in serious crime is confined to offences of acquisitiveness, while crimes of violence and of lust have, on the contrary, diminished in frequency. The enormous numerical preponderance of crimes of acquisitiveness—they constitute nearly nine-tenths of the total amount of indictable crime—makes their oscillation decisive of the general movement. For the most part offences of this class are dependent on economic conditions and vary inversely with the prosperity of the country. The editor has brought out this relationship very strikingly in a diagram showing the number of receiving orders in bankruptcy and the number of persons tried for larcenies per 100,000 of the population in each year from 1835 to 1905; the remarkable likeness between the two curves is strongly suggestive of a connexion between this mode of delinquency and the prevalent state of trade. The other varieties of crime are, of course, much less immediately related to economic conditions and are, moreover, very often influenced by such conditions in a quite different way, so that it is nowise surprising to find that very frequently, as was the case in 1905, their movement does not coincide with that of crimes of acquisitiveness. Of the more purely impulsive disorders of conduct attempts to commit suicide also showed an increase in frequency, the number of such attempts in 1905 being 2342, the highest figure yet recorded. In this connexion it may be remarked that actual suicide also increased, the number of deaths under that head being 3515, as against 3327 in 1904. The slight check to the upward movement in these two manifestations of suicidal impulse, which was apparent in 1904, has not, therefore, been maintained.

Non-indictable offences, which include a large number of acts and omissions that are only criminal in a technical sense, are of relatively small value as indications of the moral health of the community. It is worth noting, however, as a confirmation of the inferences drawn from the statistics of indictable crimes, that assaults, wilful damage to property, and cruelty to children, which are probably allied to the more serious crimes of violence, have, like these latter, decreased in frequency; the number of prosecutions for assault in 1905 (52,811) is, indeed, the smallest on record. There has also been a considerable fall in the prosecutions for drunkenness, which numbered 219,276, as against 227,403 in 1904. Whether owing to a real growth in vagrancy, or as a result merely of increased activity on the part of the police, stimulated by the greater interest which has been taken in the question recently, there has been a decided rise in the number of convictions for begging and sleeping out, the total for the year (27,496) being the largest yet recorded. From an analysis of the figures it appears that the large majority (over 90 per cent.) of offenders of this class are men, and that nearly half of them are between 21 and 40 years of age. The editor suggests that the striking predominance of males in the tramp class would go to prove that scarcity of employment cannot be a very important factor in causing vagrancy; but against this we have to remember that prostitution is available as an alternative for women.

The growing complexity of social life leads, of course, to the creation of many new crimes, so that in certain classes of non-indictable offences the figures show an increase. An interesting illustration of this point is to be seen in the prosecutions in relation to motor-cars which, in 1905, were nearly twice as numerous as in the preceding year.

The number of criminal lunatics received during the year was 196, which is considerably below the average. Of this number 114 were certified after conviction, while 15 were certified before trial, 28 were found insane on arraignment, and 39 were found "guilty but insane." As in previous years, there is a striking difference between the more serious crimes of violence and the other classes of delinquency, with respect to the time when the existence of insanity is ascertained, over 98 per cent. of insane homicidal offenders being certified at or before trial, while the corresponding proportion in non-homicidal crime is less than 25 per cent. This difference may be in part explained by the course which is sometimes taken of dismissing the criminal charge in minor offences by insane persons and certifying the culprit as a pauper lunatic; it is to be regretted that no statistical information is given as to the number of cases so dealt with and the character of the offences.

Of the matters discussed in detail by Sir J. Macdonell the statistics of homicide are specially interesting. Including under that term cases of murder and of manslaughter, he shows that these offences have decreased considerably within the last 20 years, the number per 100,000 of the population having fallen from 1·32 in 1886-90 to 0·84 in 1905. Homicide is, as a rule, a crime of men, the proportion of women amongst convicted murderers not being more than about 1 in 7. In Scotland and Ireland there is a similar predominance of males. Amongst the victims, on the other hand, women are in a majority of 3 to 2. With regard to age incidence, it is found that about 59 per cent. of the persons convicted are from 21 to 40 years old. A remarkable point is the frequency of a sexual tie between the murderer and his victim; thus, of 487 men sentenced to death since 1886, 124 had killed their wives and 115 their sweethearts or mistresses. Homicidal crime is met with chiefly in the lower order of the labouring population of seaports and manufacturing towns; it is rarely committed by habitual criminals. The generally impulsive character of the crime is shown in the frequent choice of such domestic weapons as chairs, choppers, pokers, and the like; poison is rarely used—in only about 6 per cent. of cases. More murders are committed on Saturday than on any other day of the week, while the lowest figure is found on Sunday. In about one-fifth of the cases the crime is committed between 10 P.M. and midnight, and in nearly half between 8 P.M. and 2 A.M.

On the questions of juvenile and female offenders, on recidivism, and on the characters of the criminality in certain large cities, Sir J. Macdonell also gives much interesting information which, however, hardly admits of summarising. The absence of data relative to the criminal individuality and the insufficiency of details on several points, such as the different varieties of recidivism, the sexual incidence in attempts to commit suicide, and so on, to which attention was drawn last year, must still qualify our praise of a volume which, even with these slight defects, can compare favourably with the criminal statistics of any European State.

The Surgical Anatomy of the Temporal Bone from Birth to Adult Life. By ARTHUR H. CHEATLE, F.R.C.S. Eng., Aural Surgeon to King's College Hospital and to King Edward VII.'s Hospital for Officers. London: J. & A. Churchill. 1907. Pp. 131. Price 5s. net.

THIS book is the outcome of the Hunterian lectures delivered by Mr. Cheatle at the Royal College of Surgeons of England in 1906 and, as might be expected, contains a very thorough and accurate description of the temporal bone both

from an anatomical and a surgical standpoint. Lecture I. is divided into two parts, (1) The Temporal Bone at Birth; and (2) The Surgical Anatomy of the Labyrinth. Under the first heading the bone as a whole, as it appears at birth, is minutely described and subsequently the middle-ear tract and the consistence of the outer antral wall are dealt with. The author points out the paths by which infection may pass from the middle ear to the meninges and also explains why sinus thrombosis is so rare at this time of life. In discussing the surgical anatomy of the labyrinth the operative treatment of Ménière's disease is referred to and the writer takes the hopeful view that in the future sufferers from this disease will receive relief at the hands of the surgeon. In Lecture II. the changes that occur in the bone during growth are set forth at length and amongst other things the reason of the comparatively late development of the mastoid process is explained. Then follow three most instructive chapters on the relation of the lateral sinus to the surface, the consistence of the outer antral wall and mastoid process, and the variations in the middle ear and antrum. From the surgeon's point of view these chapters are quite the best in the book and the illustrations, reproduced from photographs, are beyond criticism. The third lecture is devoted to the surgical anatomy of the structures met with in the performance of the radical mastoid operation. It contains much useful and valuable information relating to guides to the antrum, precautions in opening the antrum, and the relations of the facial nerve in the adult. A brief but concise account of Wallace's and Parry's operations for division of the auditory nerve brings the chapter to a successful termination. The book is profusely illustrated by photographs of the specimens shown at the Hunterian lectures and should prove of great value to the anatomist and to the surgeon.

LIBRARY TABLE.

War with Disease. By FREDERICK F. MACCABE, M.B.Dub., Medical Officer, South of Ireland Imperial Yeomanry. Second edition. London: Baillière, Tindall, and Cox. 1907. Pp. 125. Price 1*s.* net.—The second edition of this book, which is dedicated, by permission, to Field-Marshal H.R.H. the Duke of Connaught, has, the author says, been demanded much sooner than he had dared to anticipate and he adds that he is indebted for the demand to two factors: first, that a few regiments have ordered a large number of copies for distribution amongst the men of the regiment; and secondly, to favourable notices in the press. He has included in this edition a special lecture on "Health and Fitness," which he delivered to the recruits of the cavalry regiments stationed in Ireland during the year. Since Dr. Maccabe first delivered the lectures contained in this little book he has repeated them to the officers of the Staff College in Camberley. For this audience he went a little more deeply into the scientific reasons for the suggestions made. He has now amplified these parts and has reproduced the lectures as he delivered them at the Staff College. He has added as a second part of this book the introductory lectures which he gave to his ambulance section, in the hope that medical officers of both Yeomanry and Volunteer regiments may adopt the idea of making their ambulance classes of greater use to the regiment and to the public generally than mere renderers of first aid can ever hope to be. Dr. Maccabe has certainly made his chapter on anatomy most interesting and as he says "alive," but we venture to think that he must be joking when he writes that "my South of Ireland Yeomanry class knew their anatomy at the close of the course as well as the average medical student." In commenting on the extracts from Surgeon-General Havard's Report on the Russian Camps in Manchuria, the author selects three special points: First, the use of soup in camp and on the march, for, as he says, "Hard-working men must have liquid in some form or other. It is to be hoped that in all manœuvres in future the rush will be for the soup-cart and not for the too-often poisoned water-cart." The second point he dwells on is the use of hot, to say nothing of vapour, baths at the front. As his third point he asks medical officers to use their influence to get the hard, indigestible, and very constipating ration biscuit abolished in favour of brown bread, as the Russians have done with such good results. We consider the book to be a valuable one. Each page is well written and the different subjects are presented with a pleasing freshness.

Dissections Illustrated. By C. GORDON BRODIE, F.R.C.S. Eng. With plates drawn and lithographed by PERCY HIGHLEY. In 73 coloured plates and 37 diagrams. Second edition, revised. London: Whittaker and Co. Price 25*s.* net.—Gordon Brodie's "Dissections Illustrated" is an atlas already familiar to many medical men; to those not acquainted with it its nature may best be indicated by saying that the lithographic plates of which it consists closely follow in appearance, colouring, and range the well-known plates of Professor G. V. Ellis but are on a reduced scale. Most of the drawings are from original dissections by the author. In form the atlas is handy and portable and the illustrations convey a very good idea of the head, the neck, and the limbs as seen in ordinary dissections. In comparison with certain atlases of more recent date the illustrations of the thorax and abdomen leave very much to be desired. The central nervous system and the joints and bones are not illustrated at all.

Traité des Variations des Os de la Face de l'Homme et de leur Signification au Point de Vue de l'Anthropologie Zoologique. (Treatise on the Variations of the Bones of the Face in Man and their Signification from the Point of View of Comparative Anthropology.) By Dr. A. F. LE DOUBLE, Professor of Anatomy at the School of Medicine of Tours. Paris: Vigot Frères. 1906. Pp. xx.–471. Price 25 francs.—The results of an immense amount of painstaking investigation and of wide reading are embodied by Professor le Double in this monograph. The exhaustive way in which the subject is treated will be appreciated when it is realised that a bulky volume of over 450 pages is devoted to the variations and abnormalities of the bones of the face alone. The descriptions are minute and exhaustive; many tables of measurements are given, collected from various sources, and numerous illustrations in the text add to the value of the work. The bearing of the facts of comparative anatomy on the variations met with is discussed at length in every case. There is included a short appendix to a former treatise by the same author on the variations of the bones of the cranium in man. The book is provided with full indices, and to those interested in the subject will prove a veritable mine of information. The author claims, and we believe correctly, that it is the only work of the kind which at present exists.

Hygromedry. By HENRY EMERSON WETHERILL, M.D. Philadelphia: Published by the Author (Press of W. Ellis Johnson and Co.). Fourth edition. 1906. Pp. 82. Price $2.50.—The new word in the title of Dr. Wetherill's book denotes what he elsewhere calls medical hygroscopy, or the quantitative estimation of the water vapour given off from limited areas of the skin. He uses two instruments for this purpose. One of them, called the hygromed or medical hygroscope, is a small shallow circular box of aluminium, with eight holes in the bottom. It has a transparent celluloid top and contains a graduated scale over which a pointer is moved by the contraction and elongation of a hygroscopic membrane. The perforated portion of the instrument is placed over the area of skin to be tested and the water vapour entering the box moves the pointer

to a position on the scale which is taken as marking the relative humidity. The other method consists in the use of filter paper which has been treated with cobalt chloride, a salt progressively varying in colour from pale pink when moist to blue when well dried. A piece of this prepared paper is placed on the skin under glass, and after ten minutes its hygrometric condition is estimated by comparison with a standard graduated scale of tints. Dr. Wetherill gives a variety of details with respect to the clinical use of these contrivances. He has found, for instance, that the moisture of the skin gradually decreases with the oncoming of uræmia and sufficient notice is thereby given for commencing treatment. He says that there seems to be a normal diurnal change in the moisture of the skin not entirely accounted for by the daily change of temperature. In one case mental (not muscular) fatigue was accompanied by an increase of moisture in the palms of the hands. Short descriptions of hygrometric apparatus suggested by other investigators, as well as an account of a simple form of centrifuge, will be found in Dr. Wetherill's pages.

A Second German Course for Science Students. By H. G. FIEDLER, Professor of German at the University of Birmingham, and F. E. SANDBACH, Lecturer in German at the University of Birmingham. London: Alexander Moring, Limited. 1906. Pp. 76. Price 2*s.* 6*d.*—This is a companion volume or supplement to a similar work by the same authors which was reviewed in THE LANCET of June 23rd, 1906, p. 1764. It is a collection of 24 typical extracts from articles published in recent numbers of well-known German scientific periodicals; almost all of them deal with questions of chemistry and physics, but there is one on the technology of iron and steel and one on the analysis of graphic curves by the planimeter. The notes at the end of the book explain various German grammatical peculiarities and give some translations of unusual words. It is generally found that much practice is required before a foreigner can read a German author easily and still more practice before he can produce a readable and idiomatic translation in his own language. The present volume is an excellent introduction both to reading and translation. Roman characters are used throughout; in the reference to the combination ss (a single letter in German character) on p. 67 we should have liked to see some mention of the practice (happily rather uncommon) of transliterating it as sz, so that "dass" becomes "dasz" and "gross" becomes "grosz."

JOURNALS AND MAGAZINES.

The Biochemical Journal.—The February number of this journal contains, in addition to two papers of purely botanical interest, the following papers of physiological value:—1. The Extraction by Casein of Trypsin Adsorbed by Charcoal, by Mr. S. G. Hedin. It is shown that casein is capable of extracting trypsin adsorbed by charcoal. This gives strong support to the view that the proteins combine with trypsin before they are broken up by the latter. 2. The Diastatic Ferment in the Tissues in Diabetes Mellitus, by Dr. F. A. Bainbridge and Dr. A. P. Beddard. Experimental evidence is given of the presence of a diastatic ferment in the liver and muscles of diabetic patients. In two cases a diastatic ferment was found in the blood and in two others it was absent. 3. An Improved Method for the Determination of Sugar in Blood and other Tissues, by Mr. E. S. Edie and Mr. D. Spence. The method consists in defibrinating the blood with aseptic precautions, dialysing with a measured quantity of 0·9 per cent. sodium chloride solution for about 45 hours in an ice-chamber, boiling the saline fluid, and adding an excess of Fehling's solution. The precipitated cuprous oxide is then washed, dried, ignited, and weighed as cupric oxide. By this method of determining the amount of sugar present in blood evidence was obtained that the sugar exists in part as free sugar, in part in combination with protein or lecithin, the remainder being a polysaccharide or hydrolysible sugar. The serum alone contains sugar which was not found in the corpuscles. 4. A case of Specific Adsorption of Enzymes, by Mr. S. G. Hedin. It is shown that the α- and β-proteases in the spleen of the ox are adsorbed in the same proportions by charcoal, while kieselguhr adsorbs the α-protease more readily than the β-protease.

The Edinburgh Medical Journal.—The March number of this journal is of more than average interest. It opens with an address by Professor W. Osler on Cerebro-spinal Meningitis, in which some of the peculiarities of this disease are pointed out and reasons are given for deprecating any scare on the subject. The first Morison lecture (1907), by Dr. A. R. Urquhart, of which we have already published an abstract,[1] deals with insanity, with special reference to heredity and prognosis, and emphasises the dependence of mental states upon bodily conditions. Dr. F. H. A. Marshall and Dr. W. A. Jolly write on the influence of the ovary upon the uterus and conclude that the former gland supplies a "hormone" inducing menstruation and also some chemical substance necessary for the nourishment of the embryo in the early stages of pregnancy. Mr. B. G. A. Moynihan records some instructive cases of conditions in the large intestine simulating malignant disease.

The Scottish Medical and Surgical Journal.—Neurology is to the front in the original articles of the March number of this periodical. Dr. John Thomson and Dr. Stuart McDonald record two cases of meningococcic meningitis and suggest that attenuated meningococci may exist in the naso-pharynx of healthy children and be capable in certain circumstances of giving rise to virulent outbreaks. Dr. W. Elder and Dr. Nena Ievers give notes of five cases of the same disease in its epidemic form and state that some benefit seemed to be derived in two of these from injections of De Rienzi's anti-pneumococcic serum. Mr. J. Hogarth Pringle writes on hæmorrhage from the sinuses of the dura mater and Mr. J. S. Fraser on perichondritis of the auricle following the radical mastoid operation.

The Quarterly Journal of Microscopical Science. Edited by E. RAY LANKESTER, F.R.S., with the coöperation of ADAM SEDGWICK, F.R.S., SYDNEY J. HICKSON, F.R.S., and E. A. MINCHIN, M.A. New Series, No. 201 (Vol. LI., Part 1), February, 1907. With lithographic plates and text figures. London: J. and A. Churchill. Price 10*s.* net.—The articles contained in this number of the journal are: 1. On the Parietal Sense Organs and Associated Structures in the New Zealand Lamprey (Geotria Australis), by Arthur Dendy, D.Sc., professor of zoology in King's College (University of London), with two plates. Dr. Dendy has had the opportunity of studying the anatomy of the brain of geotria in the "velasia" stage of development and describes with much minuteness of detail the pineal eye, or rather pineal eyes, for there is clear evidence of the existence of a pair, though differing greatly in histological characters and probably in function, the right pineal organ being either the most highly developed or the organ that has undergone least degeneration. This is a very interesting article and the illustrations are excellent. 2. Studies in Spicule Formation, by W. Woodland, demonstrator of zoology, King's College, London, Part 5, dealing with the scleroblastic development of the spicules in ophiuroidea and echinoidea and in the genera antedon and synapta. The article is illustrated by two plates. 3. In a second article, accompanied by a plate, Mr. Woodland describes the Scleroblastic Development of

[1] THE LANCET, March 2nd, 1907, p. 572.

the Spicules in some Mollusca and in one Genus of Colonial Ascidians. 4. In a third article Mr. Woodland enters into a preliminary consideration as to the possible factors concerned in the production of the various forms of spicules. 5. On Neurosporidium Cephalodisci n.g.n.sp., a Sporozoon from the Nervous System of Cephalodiscus Nigrescens, by W. G. Ridewood, D.Sc., and H. B. Fantham, B.Sc., with two plates. 6. Gametogenesis and Fertilisation in Nematus Ribesii, by L. Doncaster, M.A., with a plate. 7. The Molluscan Radula, its Chemical Composition and Some Points in its Development, by Igerna B. J. Sollas, with a plate. 8. Observations on Tooth Development in Ornithorhynchus, by J. T. Wilson and J. P. Hill, with three plates.

New Inventions.

APPARATUS FOR ELEVATING THE HIPS IN BED.

Messrs. F. Davidson and Co., 29, Great Portland-street, London, W., have recently sent me a new apparatus for elevating the hips in bed which I feel sure will prove of the greatest value in all cases where the patient is very weak and helpless. I was in this condition myself about a year ago and one of the greatest troubles to me and to my nurses was the impossibility of preventing my slipping down the bed in consequence of the middle of the mattress under my hips sagging down to a lower level than that part of it under my shoulders. This trouble and discomfort I find is quite obviated by the use of the apparatus Messrs. Davidson and Co. have made for me. It consists of an oblong wooden frame, which is placed upon and across the bed. To that frame is attached another in such a

FIG. 1.

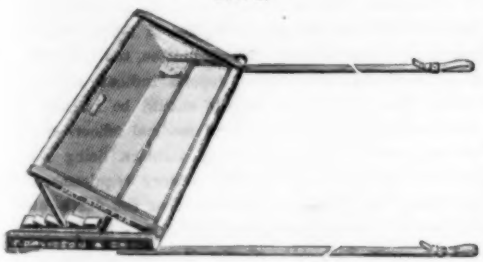
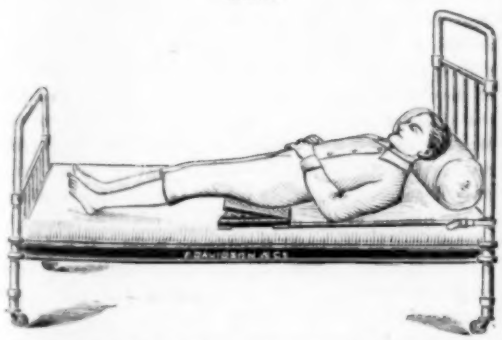


FIG. 2.



way that the side of it nearest the foot of the bed can be raised to any extent and there fixed. The space surrounded by this upper frame is filled in with spring wire, like that of a mattress, for the hips to rest upon. The lower frame has a strap and buckle upon each side, by which it can be attached to the upper posts of the bed which may often be found useful. (Fig. 1.) It requires to be placed under the patient so that one side of the upper frame comes just above the hips into the hollow of the back, the opposite one crossing under the raised thighs a little above the knees. (See Fig. 2.)

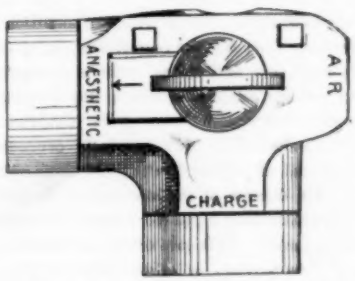
Tunbridge Wells. EDWD. G. GILBERT, M.D. Durh.

A NEW ETHYL CHLORIDE INHALER, WITH IMPROVED ASEPTIC FACE-PIECE.

THERE are so many ethyl chloride inhalers that one hesitates before recommending another. Nevertheless, I believe there is still room for one, such as I suggest, which combines simplicity, efficiency, and reliability. As seen by the illustrations (Figs. 1 and 2) a tap which regulates the

FIG. 1.

FIG. 2.



administration of the anæsthetic is introduced between the face-piece and the bag. To charge the bag the tap is turned so that the indicator points to "Charge" and the ethyl chloride is injected through a small hole in the tap indicated at A in Fig 1. The tap is then turned to "Air," thus securing the ethyl in the bag until quite ready to begin. With the tap in this position the face-piece is applied and the patient breathes air only which enters through the inlet seen in the side of the tap B in Fig. 1. At the beginning of an inspiration the tap is turned so that the indicator points to "Anæsthetic," as seen in Fig. 2. This movement closes the air inlet and opens the communication between the face-piece and the bag. This inhaler is specially convenient when a few minutes' continuous anæsthesia may be necessary, for without disturbing the face-piece air can be admitted to the patient, the anæsthetic can be shut off, and the bag can be recharged. The aseptic advantage of the improved face-piece will be evident. The face-piece being connected at its upper end instead of at its centre protects the other parts of the anæsthetic apparatus from contamination in the event of the patient spitting, coughing, or being sick. When desired the apparatus can be fitted to a Clover's inhaler.

The inhaler and face-piece have been made for me by Messrs. Rauschke, Limited, surgical instrument makers, Leeds.

ALEXANDER D. SHARP, M.D. Brux., F.R.C.S. Edin.,
Honorary Surgeon, Nose and Throat Department,
Leeds. Leeds Public Dispensary.

BRISTOL GENERAL HOSPITAL.—The following scholarships have been awarded as follows: Clarke surgical scholarship (£15) to Mr. J. F. Blackett; Sanders scholarship (£23) to Mr. J. F. Blackett; Martyn Memorial scholarship (£10) to Mr. V. B. Green-Armytage; Henry Marshall prize (£11) to Mr. J. W. J. Willcox; and Lady Haberfield prize (£27) to Mr. W. J. Veale.

THE LANCET.

LONDON: SATURDAY, MARCH 23, 1907.

The Security of Tenure and Annual Reports of Medical Officers of Health.

PUBLIC health legislation, whether under this or any other Government, is liable to prove a somewhat halting process and it is only when the harvest of death garners its sheaves in very high places that any enthusiasm for preventive medicine is manifested. But even such enthusiasm is prone easily to be damped when a powerful deputation representing the trusts or trades likely to be affected prejudicially threatens with opposition the Minister more immediately concerned with the measure in question. It is needless to furnish illustrations of this invertebrate condition; they are daily before our eyes. But the regrettable part of this state of affairs is that this molluscous attitude obtains even with regard to matters concerning which Royal commissions or departmental committees have made unanimous reports and recommendations. It is generally conceded that so long as medical officers of health hold their appointments subject to the caprice of the local authorities, so long will such officers hesitate to make recommendations and to write reports which are likely to give offence to butchers, farmers, dairymen, jerry builders, or others who may happen to be members of these local authorities. An officer appointed annually, triennially, or quinquennially is not unlikely to hesitate before he, in effect, serves a nuisance notice upon his chairman, and equally the sanitary inspector may find it convenient to avoid the slaughter-houses, cowsheds, or insanitary property of members of his district council. In existing circumstances the medical officer of health is fortunate if his council can be prevailed upon to appoint him without any reference to the duration of his appointment and with a moiety of his salary paid out of the county funds with the concurrence of the Local Government Board. In cases such as these the position of the officer is reasonably secure, as he can only be removed with the consent of the central health authority. So far there is not a very large number of such appointments but we are glad to see that the town council of Rochester has recently shown its appreciation of the services of its medical officer of health by reappointing him without specifying any time limit.

In cases where medical officers of health are in general practice and devote only a part of their time to their official duties there may sometimes be advantages in the compulsory union of districts and the appointment of a whole-time officer, and, as was pointed out some years since by Mr. CHARLES E. PAGET, the county medical officer of Northamptonshire, it would be well to improve the machinery for effecting such combinations. Probably, however, some fundamental change will have to be made if the greatest use is to be made of medical officers of health; and some rather drastic alterations, more particularly as regards rural districts, have recently been proposed by a select committee of the House of Commons which was appointed to consider the Housing of the Working Classes Amendment Bill which was, we believe, largely promoted by Dr. MACNAMARA, the present Parliamentary Secretary of the Local Government Board. The Bill in question aimed at facilitating the housing of the working classes in rural districts but the recommendations of the select committee take a much wider view of the whole problem than was contemplated by the Bill and it is clear that if such recommendations are accepted a new Bill will be called for. The committee furnishes as an appendix to its report several of the reports of medical inspectors of the Local Government Board dealing with the unsatisfactory arrangements which at present obtain in rural districts for the appointment of medical officers of health and sanitary inspectors, and much importance is attached to these reports by the committee; indeed, it would appear that such reports have formed very largely the basis of the conclusions arrived at. Although there are some ambiguous points in the report in question there is much that is useful and as a whole the document is commendably vigorous and independent. In so far as the medical officers of health and their annual reports are concerned, the committee considers that the indifference of rural district councils towards sanitation and housing is reflected in the lack of zeal or activity on the part of the officers. The memorandum of the Local Government Board relative to the annual reports of medical officers of health is, in the view of the committee, too indefinite and it suggests that where such reports indicate slackness or apathy more satisfactory reports should be insisted upon. Certainly, some of the reports of medical officers of health are of a very meagre nature, no mention being made of existing defects or of pressing sanitary requirements and too much being made of the fact that the death-rate is a low one or that the place is well suited for a health resort.

As regards Part III. of the Housing of the Working Classes Acts, the committee is of opinion that sanitary powers cannot be intrusted to comparatively small local bodies some of the members of which may be owners of cottage property or builders or agents having a direct interest in putting restraint on the administration of the existing laws. Consequently, it is recommended that the administration of the Public Health and Housing of the Working Classes Acts should be transferred from rural district councils to county councils, leaving to the rural district councils concurrent powers to build under Part III. of the Housing of the Working Classes Act, 1890, subject to confirmation by the Local Government Board. It is further advised that the appointment of a county medical officer or officers of health should be compulsory and that proper qualifications for such officers should be prescribed and insisted upon by the Local Government Board, this Board also issuing a more precise memorandum of instructions as regards annual reports and requiring strict compliance with them. It is not quite clear from the report whether these recommendations refer to county medical officers alone or to all medical officers of health, and indeed there is

much in the report which indicates some confusion of thought on the part of those who are responsible for it. They do not, for instance, appear to have appreciated the fact that the duties of county medical officers of health have not hitherto been prescribed by the Local Government Board. This and certain other points of doubtful meaning are probably due to the fact that very few medical officers of health were called to give evidence and that those medical inspectors of the Local Government Board whose reports have evidently much influenced the committee's decision were not apparently invited to attend. But all these details fade into insignificance before the fact that the committee has grasped to the full the importance of security of tenure and the improvement and independence of the annual reports of medical officers of health, and the fact is, no doubt, recognised that improvement of the reports is largely dependent upon security of tenure.

Pyorrhœa Alveolaris.

THE Erasmus Wilson lecture on Pyorrhœa Alveolaris recently delivered by Mr. KENNETH W. GOADBY is a valuable addition to the knowledge of that refractory disease of the teeth.[1] Although early loss of the teeth accompanied by an inflammatory condition of the gums has been recognised since the days of AMBROSE PARÉ, it is only within recent years that the disease has become so prevalent that the attention of the general body of medical practitioners has been drawn to its far-reaching and harmful effects. In the lecture Mr. GOADBY mainly devoted his attention to giving a *résumé* of the bacteriological researches which he has made during the last ten years and to drawing attention to the use of the vaccine treatment on the lines advocated by Sir A. E. WRIGHT. In all 90 cases of the disease were examined bacteriologically, in addition to the various conditions such as gingivitis, ulcerative stomatitis, and so on; from these investigations very little evidence was obtained of any one organism occurring with sufficient regularity to suggest its causal relationship with the disease. The chief fact brought out seems to be that a very large variety of organisms is found in the gums in ulcerative conditions and that the bacteria found in gingivitis and ulcerative stomatitis show a very curious similarity to those found in pyorrhœa. Mr. GOADBY gives a very detailed bacteriological analysis of 36 cases in which certain general symptoms were present and describes the cultural characters of the organisms isolated. In certain cases he isolated a lactose-fermenting bacillus and this organism would seem to have suggested to him that the infection in pyorrhœa alveolaris may come from contaminated milk. In referring to this point he remarks: "MCCONKEY has shown that these lactose-fermenting bacteria are primarily of fæcal origin and that they gained access to milk, from which they had been isolated by him in a large number of instances. In attempting, therefore, to discover the original source of infection in alveolar pyorrhœa the presence of these lactose fermenters naturally requires consideration. Further, cocci of both the staphylococcal varieties are often present in milk and may exhibit some degree of virulence. In the absence of any other obvious source of infection it would seem highly probable that the organisms to which at any rate the general symptoms attendant upon suppuration along the alveolar margin and at the alveolar process itself are due may come from contaminated milk." Mr. GOADBY also refers to the points that pyorrhœa alveolaris is a frequent sequela of infectious disease during which the patient has for some time been upon a milk diet and that the disease frequently occurs in several members of the same family and would seem to consider these points evidence that milk may be the original source of infection. The idea is certainly a novel one but we must confess that his evidence hardly seems to justify his suggestion. In the treatment of the disease he seems to have had some measure of success with the injection of vaccine of the different organisms and he brings forward certain facts which are of more than passing interest. He states that in curetting of even two or three sockets of affected teeth an increase of constitutional symptoms often takes place, and he considers that delayed healing is common and frequent when multiple extraction has been performed in cases of general pyorrhœa and as a precaution thinks it is inadvisable to remove more than two or three teeth at a single sitting. Most practitioners would, we imagine, dissent from this view but it is remarkable how facts easily apparent are often overlooked and it is certainly a question well worthy of attention. With the current idea that removal of the affected teeth arrests the local tissue destruction and cures the disease he does not altogether agree, and he cites a case where even after the removal of the teeth the patient lost weight, the opsonic index at the time of extraction being 0·6 and 0·5 respectively to the staphylococcus aureus and the mouth staphylococcus albus. At the end of one year the opsonic index was the same but as the result of inoculation during six months she gained 2 stones in weight, the index rose to 1·1, and chronic rheumatism from which she had suffered almost entirely disappeared. It would certainly appear that vaccine treatment may prove of some value but much more evidence and experience are necessary before anything like a definite opinion can be given. In reading through the paper we cannot help feeling that valuable a contribution as it is to the bacteriology and treatment of advanced conditions of alveolar destruction it sheds but little light upon the more important question of etiology. Why is the disease so prevalent at the present day? What are its true causes? These are the questions to be settled. The solution will probably be found by investigations carried on along lines quite other than the bacteriological.

[1] THE LANCET, March 9th, 1907, p. 633.

The New French Lunacy Bill.

DURING the past half century the lunacy laws of most countries have undergone great changes. Nevertheless, up to the present time the French have adhered to the Act which came into force so long ago as June, 1838. When we consider the date of its enactment it may undoubtedly be looked upon as a very enlightened piece of legislation. But great changes have taken place since then and in most civilised countries the tendency has been more

and more to protect the liberty of the subject; consequently in lunacy matters the public have long ago decided that they should be adequately protected against the risk of wrongful detention in an asylum. Bills have from time to time been considered by the French Senate or the Chamber of Deputies but for some reason or other they have all been abandoned. The law as it now stands permits a person to be sent to a lunatic asylum in two ways, (*a*) that which is known as the "placement volontaire," in which case the patient is detained under the order of a relative or friend, supported by one medical certificate: and (*b*) the "placement d'office," which is chiefly used in the case of violent or dangerous lunatics and is carried out on an order of a police commissary, a mayor or magistrate, supported by one medical certificate. Most persons will agree that such requirements are insufficient to insure the patient against hasty, if not wrongful, detention. Especial objection must be taken to the method known as "placement volontaire," for assuming that the person making the order directly or indirectly derives any benefit from the removal of his relative or friend to an asylum the certificate of *one* medical man can scarcely be regarded as sufficient guarantee that the case has been thoroughly considered, for it is possible that the physician may have been misled by false or exaggerated statements as to the conduct of the patient. It is true that in England to-day urgent private cases may be removed to a mental hospital under the order of a relative and one medical certificate but here it must be borne in mind that such an order only remains in force for seven days from its date, during which time further statutory papers have to be obtained, otherwise the patient must be at once liberated. In this country the methods of procedure vary according to whether the patient belongs to the private or pauper class, and by a pauper is meant any person who is unable to pay for treatment in private care, licensed house, mental hospital, or special paying wards in a borough or county asylum. The private patient can only be detained upon a reception order signed by a judicial authority, which order is granted upon the presentation of a petition and a statement which are signed whenever possible by a near relative and supported by two medical certificates.

In the case of pauper lunatics one certificate only is required, a justice of the peace making an order for detention after seeing the patient and being satisfied as to his insanity. Therefore in this country no person can be detained as a person of unsound mind unless his case has been considered by a judicial authority, whereas in France under the "placement volontaire" no such official consent is necessary. It is true that the director of any lunatic asylum, whether public or private, has within 24 hours of the patient being admitted to the establishment to furnish a certificate which is transmitted to the prefect stating that the patient is really insane, and 15 days later another certificate has to be furnished. In England the medical officer has to furnish to the Commissioners in Lunacy a medical certificate regarding the mental and bodily health of the patient not less than two clear days and not more than seven clear days after admission. This certificate is followed by another at the expiration of one calendar month, and further the reception order has to be continued by means of certificates which have to be furnished at periodical intervals throughout the patient's residence under care, even if this extends to 40 or 50 years. In addition to these precautions patients are periodically visited by members of the Lunacy Commission, and in the case of private licensed houses in the country visits are also paid by justices of the peace who are specially appointed to make such inspections. In France a monthly official visit is paid by a member of the tribunal who is evidently an official without any special training and therefore cannot be looked upon as a competent judge as to whether a patient should be detained or granted his freedom.

If the new Bill which has recently passed the Chamber of Deputies becomes law the liberty of the subject will be more carefully protected. A judicial authority will have to be applied to before an order is made for detention in an asylum. The old medical certificate is replaced by a detailed medical report which has to be sent in to a magistrate, and this magistrate has the power of demanding an inquiry before the certificate takes effect. We think that it would be wiser both in the interests of the patient and the physician who certifies that in the case of private patients the law should require two medical certificates to be provided by independent medical men. This would insure the patient being seen by at least two physicians prior to his removal to an institution and in the event of any litigation for wrongful detention arising in the future there would be less likelihood of a verdict of negligence or malpraxis being found. The certificate to be sent in at the end of 24 hours by the director of the asylum will be a much more detailed one than is the case at present and copies of it will be sent to both the procurator of the Republic of the district in which the asylum is situated and also to the corresponding official of the district whence the patient came. Fifteen days later another certificate has to be sent in to the same persons. It is not clear that either of these persons is capable of deciding the question as to whether a person is insane and a proper subject for detention in an asylum, and in any case such an authority cannot compare with our Lunacy Commission for competency. Finally, confinement in the asylum is not definitely decided upon until the president of the tribunal has agreed to it, after having thoroughly studied the different certificates which have been sent in. Further, if *anybody* lodges the smallest objection the president of the tribunal cannot come to a decision except after consulting with his court and having heard expert opinion. We do not believe that any such clauses will ever become law. Surely all this red tape cannot be required to protect the liberty of the subject and we further venture to think that such a law would be most prejudicial to the interests of the patient both from the curative and from the social standpoint, when we realise what publicity such inquiries must entail. The making of lunacy laws is always difficult but the day is past when legislators should give way to ignorant agitators. By all means let the person and the property of the insane be protected but let it also be borne in mind that there is another point of infinite importance, the recovery of the patient from his malady.

Thus in the endeavour to protect the patient neither should laws be made the working of which is vexatious to those who have the care of the insane, nor should they be so cumbersome as to prevent the possibility of early treatment.

Annotations.

"Ne quid nimis."

THE DEATH OF M. BERTHELOT.

THE death of M. Berthelot, under painfully dramatic circumstances, following so closely upon that of M. Moissan creates a wide gap in the ranks of distinguished French chemists. The illness of his devoted wife had sorely affected the health of the great savant and the news of her sudden death proved to be such a shock to him that he never rallied and he entered the unknown practically in her company. M. and Madame Berthelot died in Paris on March 18th. Marcelin Pierre Eugène Berthelot was born in 1827 in Paris and was the son of a physician. His genius quickly showed itself in the early years of his education and his success in gaining a prize in an open competition on scientific subjects decided his career. At the age of 24 years he entered the Collége de France, in which he occupied the position of assistant to the lecturer on chemistry and thus his opportunities of gaining an insight into the teachings of chemical science widened. In spite of the number of great and fruitful investigations which he undertook with extraordinary energy and skill, he found time to serve the Government of his country. He was Minister of Public Instruction in 1885, four years after he had been elected a life senator, and in 1895 he was appointed Minister of Foreign Affairs. Berthelot's contributions to chemical science are known on account of their immense importance the wide world over. He attacked the great problems of the constitution of matter with extraordinary energy and success. He laid the foundations of organic synthesis and was practically the founder of thermo-chemistry. Our knowledge of the chemical constitution of glycerine and the fats is largely due to Berthelot's keen insight and analytical acumen. He showed that the fats were natural glycerine ethers of various fatty acids. The outcome of these researches was a stimulus to the industry of glycerine making and the manufacture of stearine candles. The results of his beautiful investigations on this subject were embodied in a work entitled "Sur les Combinaisons de la Glycérine avec les Acides," a masterpiece of research which gained for him the admiration of the whole scientific world. In the same masterly manner he produced his comprehensive work, "Chimie Organique fondée sur la Synthèse" in 1860. In 1879 he published the fruits of his attack on thermo-chemical problems ("Mécanique Chimique fondée sur la Thermochimie"). Lastly, chemical literature was considerably enriched by the publication of his classical work "Les Origines de l'Alchimie." France and the whole scientific world have indeed lost a giant of research in the death of M. Berthelot; he has left a magnificent record of fruitful labour, he has gone before as a splendid example to those who are engaged in the earnest pursuit of the same momentous problems, and for years and years to come the results of his genius must shine forth.

THE IRISH UNIVERSITY QUESTION.

THE Irish University question bristles with as many points of dispute as does a sea urchin with prickles, and it is almost impossible to discuss it without entering upon regions of controversy where the medical man is an intruder. But it is not difficult to see that the scheme of the late Chief Secretary cannot commend itself to scientific teachers and students. The scheme, it is understood, provides that Trinity College, Dublin, which is the university of Dublin, should be abolished and that a new university bearing the old name should be founded, including Trinity College; Queen's College, Cork; Queen's College, Belfast; and a new college for Roman Catholics in Dublin. Maynooth; Queen's College, Galway; and Magee College, Londonderry, were to be affiliated institutions. The present Royal University was also to be done away with and all its existing graduates were to be attached by Act of Parliament to the University of Dublin. This scheme, like most schemes which try to please everyone, pleases no one, so that the consolidation of forces aimed at by the scheme could be only consolidation in appearance. Trinity College is naturally unwilling to lose its ancient prestige and to become a mere college of a university created by Act of Parliament. The senate of the Royal University does not receive a death warrant with pleasure, the leaders of Roman Catholic opinion, both clerical and lay, condemn the scheme, and Lord Justice FitzGibbon in his refusal to accept it may be taken to express the opinion of a large section of non-Roman Catholics. Moreover, all the heads of the various colleges concerned object in the main, though here and there support is forthcoming. There is another scheme which finds some support—namely, that the University of Dublin should in future consist of two Colleges, Trinity College as at present, and the hypothetical New Roman Catholic College. But to this scheme both parties concerned object. The Roman Catholic Hierarchy and many of the Roman Catholic laity are apparently willing to have their new College made an integral part of the existing Royal University. This is the scheme which was adopted in the minority report of the late Royal Commission and signed by Sir Edward Fry, Sir A. W. Rücker, and Mr. S. H. Butcher.

THE UNION OF THE LONDON MEDICAL SOCIETIES: THE POSITION OF THE MEDICAL SOCIETY OF LONDON.

As our readers know, the Medical Society of London has stood aloof from the combination of the London medical societies and reference was made to the matter by Mr. C. A. Ballance, the President of the Medical Society of London, in his speech at the recent festival dinner of the society. We regret that our necessarily brief note upon this dinner could not include fuller details of the speeches, but the following passage in Mr. Ballance's speech is of great interest at the present moment. "Perhaps it may be expected of me," said he, "that I should say something about the union of societies (of which many of us are members) which has recently taken place and which has been so much before us during the last two years. London is so vast that no one society and no union of societies can satisfy the whole wants of the profession. There must and ever will be many societies, but we the Medical Society of London wish the union of societies which has taken place a brilliant future and great prosperity. No one can doubt that union is a good thing and that it is better to pull together, rather than in isolation. I have already expressed the good wishes of the Medical Society to the union of societies. May I also express an earnest hope that we, the Medical Society of London, may be the recipients of the same kindly feelings, the same hearty sympathy, and the same friendly and generous acts from the union of societies as we have been accustomed to receive from each of the uniting societies before they became amalgamated into one great and powerful body. There are three societies of considerable antiquity in London which are all doing good work and whose membership is for the most part

made up of general practitioners. I refer to our own society, to the Hunterian Society, and the Harveian Society. I should like to throw out the suggestion that in some way or other these societies might be affiliated together. They would still have to carry out their ordinary work separately and in different parts of London, but perhaps we might meet once a year altogether for some common object or purpose, and later perhaps we might become affiliated to the specialist and scientific societies which have united together and which will have their home in future at 20, Hanover-square." It will be seen that Mr. Ballance furnishes a reason for the absence of the Medical Society of London from the great coalition which has not been hitherto put forward—at least, we do not remember to have heard the argument before. We cannot help regretting, for our part, that this or other reasons prevailed with the Medical Society to the extent of preventing their adherence to the new amalgamation, but we are certain that all members of the new amalgamation, a large proportion of whom will rightly be general practitioners, will continue to wish good fortune to the Medical Society of London.

THE STANDARDISED SAUSAGE.

THE sausage is a common subject of jest since it is so often regarded as a convenient vehicle for materials which when undisguised certainly do not appeal to us as being suitable or even wholesome for the purposes of food. Whatever objectionable plan may have been practised in regard to the compounding of sausages in past times it seems probable now that on the whole sausages are made with wholesome ingredients, thanks to a careful system of inspection of our meat supplies. Though, however, the sausage may contain innocuous substances there can be little doubt that it affords opportunity for the perpetration of considerable fraud upon its patrons. This is not surprising when we find that there is absolutely no legal or authoritative definition of a sausage. The sausage that contains 90 per cent. of bread and 10 per cent. of meat is just as much a sausage as that which contains meat and bread in the inverse proportion. It is clearly illogical and unfair to the purchaser that such should be the case. As a rule, the sausage is looked upon as supplying the place of meat and as a meaty and not farinaceous food, and doubtless it is bought with the idea that it supplies the same nutritious qualities as does meat itself. Moreover, the average price of sausages per pound is approximately that of the meat of which they are supposed to be made. When, therefore, the sausage contains, say, 75 per cent. of bread and the purchaser is charged from 8*d*. to 10*d*. or 1*s*. per pound for it, a very decided fraud is surely being perpetrated upon him. At all events, it will be agreed that bread is very dear which costs as much as 10*d*. or so per pound. Such a figure in point of fact represents about ten times as much as the value of bread at the present time. In our view this species of fraud is every whit as bad as putting a cheap substitute in butter or coffee and yet the practice continues unhindered and uncontrolled by any statute. Purchasers of the sausage are to be found largely amongst poor people and the fraud is practised probably for the most part in poor neighbourhoods. Generally speaking the tampering with the nourishing quality of food is bad enough but when the practice affects those who struggle most for a living, who find it hard to procure nourishing meals at all, it becomes monstrous. Surely it is time that the sausage should be standardised and that the selling of a commodity by that name should be an offence unless it is proved to contain a reasonable amount of meat. There is nothing to be said against a well-made sausage which is prepared with sound meat. On the contrary, it affords a valuable, convenient, and appetising food, and that being so, the sausage should be standardised so as to prevent it from being loaded with a cheap substitute which is nearly always bread or broken and waste biscuits. We can see no difficulty about introducing such a desirable reform and abolishing a palpable fraud. The practice may not poison people but it certainly swindles them.

THE VIRTUES OF THE OLD APOTHECARIES.

THE medical profession is generally supposed to have been at a very low ebb in point of learning and disinterestedness during the middle years of the eighteenth century. It is instructive, therefore, to find an apothecary, who was also well known in literary circles in his day, taking up the cudgels in his colleagues' behalf. In his once much-admired work on the "Government of Children," published in 1753, James Nelson complains that, owing to the prevalent distrust of the medical profession, parents are unwilling to call in a practitioner when their children are ailing. The passage in which he defends the profession as a whole is curiously modern in tone and even in detail.

As for the calumnies, the sneers, and the misrepresentations of ignorant and designing people, such as apothecaries and physicians being in league together, and playing into one another's hands; the eleven-pence in the shilling; the cramming people w h physic they do not want; and much more of the like nature; these are things that scarcely deserve any notice. I have now been full thirty years in the business; have seen and done far from an inconsiderable share; have attended with physicians of every rank, from those who first enter'd into practice up to those who have reach'd the summit; yet cannot charge either any single physician, or myself, with even an attempt to enter into an association to the prejudice of mankind. On the contrary, I have seen some who have laboured with disinterested zeal for their benefit; not merely because they could not have their fees, but because they would not take them. Here I cannot help observing how much the world is misled by appearances; because people see an apothecary with a good suit of cloaths on, they conclude he is above want; and because they see another in a chariot, they pronounce him rich: so too because a very few physicians make fortunes, they conclude that all the profession are wealthy. But how fallacious is all this! There is no profession, no trade in the kingdom, which we call genteel, that has so few rich men in it as the different branches of physic. Many a man in it, sensible that the world would have no opinion of his skill, if he appeared to disadvantage, keeps up a part with aching heart; many a chariot is in daily danger of breaking down; and many owe their stability more to their own patrimony, to their wives' portion, or some other fortunate event, than to the produce of their business.

SANITARY ADMINISTRATION IN PAIGNTON.

THE high standard of sanitation which some "health resorts" are accustomed to claim for themselves would not always be maintained were there not in each place a candid friend or an outspoken medical officer of health. Paignton enjoys the somewhat unusual position of possessing both in some degree. The candid friend tells us "that illness of various sorts seems to be epidemic" and alleges that cases of infectious illness are continually being heard of. Apparently, too, until quite recently illness and malaise were attributed to a sewer which leaked, and bathers encounter sewage near the shore under certain conditions of tide and wind. Isolation accommodation is said to be inadequate and owing to cases of enteric fever occupying the hospital cases of scarlet fever have to be left in their homes. Although it does not appear that the zymotic death-rate is a high one, a town such as this, with a population of some 9000, ought not to have such a prevalence of scarlet fever as is indicated by the notification returns, while as regards enteric fever its continued presence year by year is not a reassuring circumstance; nor ought a health resort of this character to have an infantile mortality of 125 per 1000 births. We are told also by a local critic that the water is unsafe to drink unless it is boiled but on the other hand it is alleged that such boiling is only called for in consequence of the hardness of the existing supply. Similarly the floating sewage is accounted for by the presence at times of the Channel fleet, the disposal of the

excrement of which is not under the control of the Paignton district council. As regards the disposal of refuse a destructor is said to be necessary—"urgently needed" are the words of the medical officer of health—while the action taken by the council in the matter of a new water scheme, which is to cost a large sum of money, is, the medical officer of health asserts, most unbusiness-like and attended with an air of mystery which he finds it difficult to understand. In his view the officials ought to know what is proposed to be done in the matter of water-supply to the various parts of the town. Then, again, the district councillors are apparently disregarding their own by-laws which provide that any road over 100 feet long must be 36 feet wide. The medical officer of health now tells us in his annual report that the district council is proposing to expend public money on making a road 600 feet long and 24 feet wide. Without additional knowledge we can express no further opinion than to endorse cordially the statement of the medical officer of health when he observes that "the work of your officials is difficult enough without its being possible for the public to turn upon us and say, your council itself does not carry out its own by-laws. If Paignton is to retain its good name as a first-class town this course of procedure must be stopped, or it will thereby bring self-government into disrespect and ridicule." In connexion with this statement and the attitude of medical officers of health generally we may draw attention to our leading article in the present issue on the security of tenure and annual reports of medical officers of health.

EARLY RUPTURE OF THE PREGNANT TUBE.

ON p. 805 of our present issue Dr. C. A. Scott Ridout has recorded a very interesting case of extra-uterine gestation which ruptured two days after the cessation of the last period. The patient, a young nullipara, had been married only two months previously and had been in excellent health, the only abnormal circumstance which she had noticed being that her last period had not continued for as many days as usual. On the morning of the second day after the cessation of this period she was seized with sudden collapse and the signs of internal hæmorrhage, and Dr. Ridout, on opening the abdomen, found an early tubal pregnancy situated in the isthmus of the left Fallopian tube which had ruptured into the abdominal cavity. The case is in many respects a typical example of the usual course pursued by this variety of tubal gestation. It is not unusual for a pregnancy in this portion of the tube to rupture within the first month of the date of conception and from the position of the ovum rupture of the tube is more common than tubal abortion, although tubal abortion in the majority of cases of tubal gestation is more frequently met with in the proportion of 4 to 1. Professor Taylor has pointed out that in many of these cases there is a condition of atrophy of the tubal wall and he is inclined to think that this is an important factor in causing the early rupture. Others have called attention to the same fact and whether it is associated with some atrophy of the tubal wall or not, at any rate most of the recorded cases of very early rupture are examples of isthmial pregnancies. One of the most remarkable cases of this kind is that recorded by Dr. Rumley Dawson,[1] in which on the fifteenth day from the certain date of insemination the tube ruptured. It is characteristic of such early cases that as a rule the tube ruptures without any apparent cause as happened in Dr. Ridout's case. Whether there is any atrophy present or not to explain the early rupture no doubt it is predisposed to by the fact that there is very little room for the development of the ovum in this portion of the tube and therefore an early rupture of the gestation into the peritoneal cavity may naturally be expected. The large amount of bleeding which occurs when the minute size of the ovum is considered is astonishing. In the present case the small swelling found on opening the abdomen was only of the size of a hazel nut, and in a case recorded by Professor Howard Kelly in which the patient had not missed a period and bled to death, the swelling in the isthmial portion of the tube measured only one centimetre by two centimetres. In another case of the kind recorded by the same author in which the patient had gone two weeks over her time the little bluish mass in the tube measured only 1·5 centimetres in diameter, although two and a half litres of blood were removed from the abdominal cavity. The diagnosis of these dangerous cases is, as a rule, easy since there is no other condition except acute poisoning which will cause such dangerous symptoms of collapse in an otherwise healthy patient.

[1] Transactions of the Obstetrical Society of London, vol. xl.

"SUNLESS MANCHESTER."

A CORRESPONDENT writes:—"Such is the heading of some communications to the Manchester papers respecting the gloomy overhanging pall of smoke so patiently tolerated by the long-suffering people, though it has a perpetually injurious influence on the life of both man and plant. This recognition of the evil springs up afresh from time to time and then after a while the 'smoke nuisance' seems to be forgotten again. Whether the recent revival of interest in the matter will lead to anything practical in the way of remedy cannot yet be told. Professor Weiss has spoken of the amount of light of which we are robbed by smoke and fog and of the difference found between the light in London and that at Torquay. 'It was like night as compared with day almost.' And as 'it [light] is an essential factor in the growth of plants ..... everything must suffer in big towns like Manchester, not merely from fog, but under ordinary conditions.' Many years ago Mr. John Leigh, at that time medical officer of health of Manchester, drew attention to the sooty, tarry coating of the leaves of plants and to the choking of the stomata of the leaves in plants condemned to struggle for life in the Manchester of his day; and Professor Weiss says that the microscope shows each breathing pore to be filled with a little plug of black matter. But worse even than the diminution of light, due to the large quantity of carbon in suspension in the air, is the effect of the acid from the sulphur in the burnt coal, which, getting into the pores, attacks the tissue and causes the plant to shrivel up. A practical illustration of the presence of acid in the air can be obtained on any damp drizzly morning in the smarting of the eyes produced by the descending drops. Some ten or more years ago Dr. G. H. Bailey of the Victoria University made careful investigations as to the Manchester atmosphere and it is to some degree satisfactory that he does not think it is as bad now as it was then. The anti-smoke crusade was at first directed more against the various works in and around the town than to the grates and chimneys of private dwellings and at the time it was quite justifiable, for the numerous tall chimneys belched forth dense masses, rather than clouds, of black fuliginous smoke. Dr. Bailey thinks there is more enlightenment than there was among the city authorities, manufacturers, and others and that something has been done to improve the state of things and it must be acknowledged that black smoke from the tall chimneys is less in evidence than it used to be. It is now coming to be seen that 'the great trouble is from the miles and miles of small houses in such districts as Hulme,' from which the smoke does not get away but 'with a moist and heavy atmosphere it flows downwards.' Dr. Bailey found that some of the worst parts of Manchester for smoke at the ground level were the parts without factories.

Professor E. Knecht has stated that one effect of smoke is not, perhaps, often considered—namely, the reduction of temperature. When travelling on the Continent he noticed in passing through one great manufacturing town an appreciable lowering of the temperature and that when they had passed beyond it there was a return of the warmth which they had experienced before. The absence of sunlight means also that its beneficial effects in the destruction of many pathological bacteria are also wanting, and though we cannot yet measure our loss in this respect, yet we know it must be great. Of the remedial measures Dr. Bailey would place careful stoking almost before the use of the various smoke-consuming contrivances which require constant intelligence in the using if their benefits are to be obtained. The cheapening of gas and its more extensive use for heating and cooking would also lessen visible smoke. That it might be cheapened when a profit of £60,000 goes to the relief of rates is evident, and this money would be more useful if devoted to lowering the price of gas for cooking and heating purposes and so lessening the production of smoke from private chimneys. Professor Weiss also suggests that the sanitary committee, in addition to the power of inspecting drains and closet fittings and of condemning the faulty ones, should, for the benefit of future tenants, have the power of compelling the builders to put in efficient grates. Mr. T. C. Horsfall has frequently drawn attention to the Arnott grate or stove as economical in the consumption of coal and effective in lessening the production of smoke. Unfortunately, however, it does not now seem to be made. At a meeting of the Manchester Association of Engineers held on March 9th the adoption of mechanical draughts in the firing of boilers was strongly advocated as securing the complete combustion of fuel and preventing the production of black smoke. One advantage would be welcomed by lovers of the picturesque as there would be no necessity for the erection of the lofty chimneys so disfiguring to the Lancashire landscape. Perhaps it may turn out that in the multitude of counsellors there may be safety and that some effective means may be devised for lessening the gloomy conditions under which the life of Manchester is carried on." We may point out that we have pleaded for such a desirable state of things in an annotation in THE LANCET of August 13th, 1904, under the heading of "The Passing of the Chimney."

THE DETECTION OF ACETONE IN THE URINE.

THE importance of a trustworthy test for acetone in urine is such that the improved modification of the sodium-nitroprusside reaction described in a note by Mr. Basil J. F. Jacksontaylor, published in another column, will be read with interest. Hitherto this test has depended upon the darkening which takes place on the addition of acetic acid to a solution of sodium nitroprusside, urine, and liquor potassæ. Mr. Jacksontaylor now suggests the substitution of strong ammonia for the liquor potassæ and the elimination of the use of acetic acid. Strong ammonia solution is accordingly added to a solution of sodium nitroprusside and urine. The strong ammonia solution if added carefully remains clear on the top of the fluid. "Should acetone be present, even in minute quantity, a well-marked and absolutely characteristic ring of magenta appears within from one to three minutes at the junction of the two fluids and gradually *spreads upwards*, pervading the whole of the ammonia solution if acetone is present in considerable amount." We have tried this test in THE LANCET Laboratory and find that it responds admirably. When carried out in the manner directed the test provides a simple and trustworthy method of diagnosing a urine containing acetone and is a decided advance on the tests hitherto employed. Strong ammonia solution keeps its place on the top of the urine and the diffusion of purplish colour can readily be observed even when the amount of acetone present is small. We have received a pencil drawing showing the upward diffusion of the reaction but the test cannot be strikingly illustrated unless the drawing is coloured.

THE PAYMENT OF MEDICAL MEN UNDER THE MIDWIVES ACT.

AT the last monthly meeting of the Rotherham corporation the following recommendation of the midwives committee was carried after considerable discussion:—

The committee recommend that the council agree to pay a fee of £1 1s. where a medical gentleman is called in, at the request of a midwife, in cases of flooding, convulsions, and rupture of the uterus upon the following terms and conditions—namely: These payments will be made contingent on a certificate and report being furnished by the medical attendant to the midwives' committee of facts within the knowledge of the medical practitioner which may appear to the authority necessary to the elucidation of the case. They will also be contingent on the carrying out by the medical practitioner at the earliest possible moment of any procedures arising out of the visit for which the sum of £1 1s. will be considered an inclusive charge. All cases, in fact, to be treated as cases of emergency by the medical practitioner called in. These payments will only be made in the foregoing circumstances where the income of the family does not exceed the following rate:—

Man and wife	21s. per week.
Parent or parents and 1 child	23s. ,,
Parent or parents and 2 children	25s. ,,
Parent or parents and 3 children	27s. ,,
Parent or parents and 4 children	29s. ,,
Parent or parents and 5 children	30s. 6d. ,,
Parent or parents and 6 children	32s. ,,
Parent or parents and 7 children	33s. ,,

The matter was brought before the corporation of Rotherham by the Rotherham and District Medical Guild and we congratulate the Guild, the borough, and Dr. Alfred Robinson, the medical officer of health, upon the decision. It is an obvious blot upon the Midwives Act that there is no provision for the payment of the medical services which in certain conditions it is compulsory upon the registered midwife to seek, and the corporation of Rotherham has made a progressive move in dealing with the point as it has done.

THE LOCAL GOVERNMENT BOARD AND PRECAUTIONS AGAINST CEREBRO-SPINAL FEVER.

AS an outcome of the attention which is being given to epidemic cerebro-spinal meningitis and of the knowledge now obtained regarding the relation to this disease of Weichselbaum's meningococcus experimental work has lately been undertaken with a view to obtain a satisfactory serum for the prophylaxis or curative treatment of the disease. In particular a serum has been prepared by Professor W. Kolle from horses which have been rendered immune with cultures of the meningococcus. We are informed that the President of the Local Government Board has now authorised investigations to be made in the medical department of the Board with a view to ascertain whether the value of particular sera, especially for prophylactic purposes, can be determined by animal experiment, and whether any special mode of preparation is likely to increase the effectiveness of "anti-meningococcic" preparations of this kind. In view of threatened extensions of cerebro-spinal fever in the United Kingdom this inquiry is timely and the results obtained will be looked for with interest.

HISTOLOGY AND BACTERIOLOGY OF HUMAN AND BOVINE TUBERCULOSIS.

THE Royal Commission on Tuberculosis has just issued the first of the supplemental volumes which were promised in its second report. The volume in question is a report made to the Commission by Dr. Arthur Eastwood on comparative histological and bacteriological investigations of the relationship between human and bovine tuberculosis.[1] Dr. Eastwood

[1] London, Wyman and Sons, Fetter-lane; Edinburgh, Oliver and Boyd; Dublin, E. Ponsonby. Cd. 3378. Price 2s. 8d.

records and compares the nature of morbid processes set up experimentally by tubercle bacilli of human and bovine origin respectively, and also the cultural characters of bovine and human bacilli from a variety of different sources. The general result of his observations has led Dr. Eastwood, in reporting to the Commission, to emphasise the underlying unity of the morbid processes produced experimentally by infection with every variety of human and bovine tubercle bacillus. The Commission, in its second report, drew freely on Dr. Eastwood's observations, and the volume now issued illustrates the magnitude and thoroughness of the research which has been made into this aspect of the subject We hope to revert later to some of the questions raised by this valuable report.

HEALTH STATISTICS OF THE PEABODY BUILDINGS.

THE forty-second annual report of the governors of the Peabody Donation Fund contains some most satisfactory statistics relating to the health condition during 1906 of the 19,737 residents of the buildings owned by the Trust. It is pointed out in the report that the birth-rate among the residents was equal to 30·5 per 1000, exceeding the general London rate by 3·8; that the death-rate did not exceed 12·5 per 1000 and was 3·2 below the mean rate in London; and that the rate of infant mortality was only 84·9 per 1000 births, against 133·0 in the whole of London. It appears that the buildings occupy nearly 33 acres in various parts of the metropolis and that the mean density of population on this area is equal to 603 persons per acre, or nearly ten times the mean density throughout London. The low death-rate of 12·5 per 1000, among a population with a mean density of 603 per acre, affords conclusive proof that a high proportion of persons to an acre is not necessarily dangerous to health. Tested by another standard it is clear that there is no overcrowding in the Peabody Buildings. The Census Commissioners in their report on the census in 1891 adopted as a standard of overcrowding any excess in ordinary tenements beyond two occupants per room. It appears from the Peabody report under notice that at the end of last year the governors of the trust had provided 12,328 rooms for the artisan and labouring poor of London, exclusive of bathrooms, laundries, and lavatories; as these rooms contained a population of 19,737 persons, the average number of persons per room did not exceed 1·6, well within the standard of overcrowding adopted by the Census Commissioners. The report states that the average weekly earnings of the head of each family in residence at the close of last year did not exceed £1 1s. 9d., showing that the residents are of a distinctly working-class character. That in a distinctly working-class population of nearly 20,000, for the most part residing in the north of London, the rate of infant mortality should be as low as 84·9 per 1000, affords striking testimony of the value of the Peabody Trust and should afford the greatest encouragement to those who are labouring to reduce the waste of infant life which is now the most unsatisfactory feature of English public health administration.

LESSONS IN THE MANAGEMENT OF INFANTS.

"I HAVE no hesitation in saying that in my opinion the proper time to teach girls about babies is from 10 to 13 years of age." These are the words of Mr. Benjamin Broadbent, the ex-mayor of Huddersfield, in his preface to a leaflet[1] by Mrs. Watson on the subject of the care of infants. This little publication of 12 pages has been prepared with a view to its being used in public elementary schools for the instruction of girls. It is written in the very simplest language and contains quite enough information for the instruction of girls of this age. The first of the five lessons is devoted to the subject of baby's food, the second deals with the preparation of artificial foods, the third with washing and clothing, the fourth with sleep and fresh air, and the fifth with general hygienic rules, and the whole concludes with a list of questions which it is suggested should be put to the girls at the end of each lesson. In every respect this is an admirable little book, the advice given is quite sound, and the information is correct, while there is nothing in it to offend the most sensitive sense of delicacy, although, as Mr. Broadbent says, "it is a difficult matter to prepare girls for motherhood without endangering the freshness and sweetness of their innocence."

[1] Lessons on the Care of Infants, by Mrs. Watson. Copies may be obtained from Mr. B. Broadbent, Gateshead, Lindley, Huddersfield, at 1d. each, or 9d. per dozen.

DISEASES OF THE URINARY ORGANS AT THE NECKER HOSPITAL.

A COMPLETE course of clinical demonstrations upon diseases of the urinary system will be held at the Necker Hospital, Paris, under Professor Albarran, commencing on April 18th. The course will last three months and will include about 80 lectures. The symptomatology and the diagnostic points of the various diseases will be lectured upon and illustrated by the exhibition of patients. Those attending the lectures will be given opportunities for the practical examination of patients as well as for instruction in the handling of cystoscopes and various other instruments used in the diagnosis and treatment of urinary disorders. Three lectures will be given per week in the Salle de la Terrasse, commencing at 2.30 P.M. During the first month those attending the courses will attend the consultations held every morning in the Salle de la Terrasse and during the two other months they will accompany Professor Albarran when he goes round the wards and at his demonstrations at the bedside. The number of those who can attend the class is limited. All information as to the conditions necessary to be observed for attending the classes can be obtained from Dr. Ertzbischoff, chef de clinique of the Necker Hospital.

EIGHTH INTERNATIONAL CONFERENCE OF RED CROSS SOCIETIES.

WE understand, although no official information seems to have been given, that the Eighth International Conference of Red Cross Societies will be held in London from June 10th to 15th. We do not know who are responsible for the arrangements, but it has been said that their Majesties the King and Queen will receive the delegates at Windsor and amongst the entertainers will be the Marquis and Marchioness of Salisbury, Lord Rothschild, and others. It is believed that our guests will number about 200, and these will include some of the most distinguished men from all the continental States of Europe, America, Japan, &c. Several of these gentlemen will be accompanied by their wives and daughters. The Central British Red Cross Society has been dissolved and a new substitute is in course of organisation. This is very much to be regretted, as we fear that the members of the older societies, many of which have existed for nearly 40 years, will change their opinion as to this being a practical nation. We once possessed a national society, but this has been swept away, and for more than a year attempts have been made to replace it, but hitherto without much result. The conference will afford an opportunity for us to learn something about the work in other countries, and we hope that a hall of sufficient space will be secured to enable some hundreds of persons interested in Red Cross work to attend the sittings of the congress and to learn something as to the manner in which it is regarded in other countries. This is

a matter in which the whole Empire is concerned and the sooner the utmost publicity is given to the scope of the conference and the manner in which it is to be conducted the easier it will be to give satisfaction to our guests, not only socially but also in forwarding the objects for which they are coming to visit us. In connexion with the conference an exhibition of ambulance material is to be arranged and we should be glad to have some information as to this to place before our readers.

BILL FOR PASTEURISING ALL MILK SOLD IN NEW YORK CITY.

ACCORDING to the *New York Medical Record* of March 2nd a Bill providing for the pasteurisation of all milk sold in New York City has been introduced into the New York State Assembly. By the operation of the proposed measure the dealing in, and selling of, any milk in New York City which has not been pasteurised would bring upon the parties handling the milk imprisonment for not less than six months or a fine of £100 or both. It is provided by the Bill that the Commissioner of Health shall designate pasteurising stations at which every quart of milk taken into the city must be put through the process of pasteurisation and that the city must construct such stations. Following the process a stamp will be put upon the milk receptacle by the health authorities, whereupon the dairy and milk companies and any others whose milk has been subjected to the process may take their milk and deliver it. The Bill also makes provision for the confiscation and destruction of any milk found to be unpasteurised. Authority is also given for the appointment of a large number of additional milk inspectors. The Bill is very sweeping in its character and its introduction may be said to be due to the vigorous crusade in favour of pasteurising milk which has been carried on for some time by the lay journals of New York city.

EPIDEMIC CEREBRO-SPINAL FEVER.

CASES of cerebro-spinal fever continue to be reported from various localities, but there is no epidemic prevalence except in Glasgow and Belfast. On March 13th the medical officer of health of Chelsea reported to the borough council that a child in Ives-street, Chelsea, had been attacked by the disease and had been removed to a hospital. A fatal case has occurred at Little Corbey, midway between Brampton and Carlisle. Cases have also been reported at Tollesbury on the Essex coast, in Shropshire, and at Bolsover in Derbyshire. In Glasgow on March 15th there were 112 cases under observation as compared with 101 on March 8th; as mentioned in THE LANCET of March 16th, p. 753, the daily announcement of the cases notified and the deaths has been discontinued, but on March 19th the medical officer of health issued a statement showing that during the past fortnight there had been 93 cases and 55 deaths, as compared with 90 cases and 60 deaths in the preceding fortnight. There have been two fatal cases in Greenock, four in Kirkintilloch, one at Kilwinning, and one in the Cluny district of Aberdeenshire. The Registrar-General's returns state that during February there were 140 deaths attributed to the disease in the eight principal towns of Scotland, being 66 more than in January. Of these 111 were registered in Glasgow, 13 in Edinburgh, 8 in Paisley, 5 in Leith, and 3 in Dundee. In Belfast the total number of cases notified up to the present time is 185, and there have been 104 deaths. In Dublin there has been no new case since March 6th; in all there have been 15 cases with 11 deaths, and on March 15th there were four patients under treatment.

THE Department of Public Health of Queensland, in a bulletin dated Feb. 2nd, states that 3 more cases of plague have been notified since the date of the former bulletin, Jan. 26th. Case 16 was inadvertently omitted from the last bulletin and in proper sequence of cases from the New Farm area it should be numbered case 10*a*. The patient was a female, aged 14 years, coming from James-street, New Farm, and being a sister of patients Nos. 6 and 7 and a daughter of the patient No. 15. She was attacked on Jan. 25th with bubonic plague and is progressing favourably. The 3 cases admitted during the week—viz., 17, 18, and 19—were 3 males, aged respectively 49, 42, and 52 years. They were all attacked between Jan. 24th and 26th and were members of the cleansing gang working in the infected area. They were all employed in removing produce from Garnett's Store and probably contracted the disease from infected dust while engaged in cleansing. During the week two of the patients died. With regard to Port Douglas no further cases have occurred since the last bulletin. As regards the Mauritius a telegram from the Governor received at the Colonial Office on March 15th states that 1 case of plague was reported during the week ended March 14th, and there was 1 death from the disease.

H.R.H. Prince Christian, the Danish Minister, the Portuguese Minister, the Greek Minister, the Swedish Minister, the Archbishop of Canterbury, the Bishop of London, the Archbishop of Westminster, and the Chief Rabbi will support H.R.H. the Prince of Wales at a dinner, at which he has graciously consented to preside, to be held at the Hotel Cecil on May 14th in aid of the National Sanatorium for Workers Suffering from Tuberculosis. Mr. Alfred de Rothschild will kindly lend his band for the occasion.

THE Queen has graciously intimated to the Lord Mayor that she will open "The Queen's Fête" in aid of cripple children at the Mansion House on Thursday, June 13th. Her Majesty has also consented to receive purses from children on the occasion in behalf of the fund.

THE King has been pleased to appoint Mr. William Henry Power, C.B., F.R.S., F.R.C.S., Medical Officer of the Local Government Board, to be chairman of the Royal Commission on Tuberculosis in the room of Sir Michael Foster, K.C.B., deceased.

THE Pirogoff Society of Russia is agitating for permission to call a pan-Russian congress of Russian medical men for May 8th next.

Dr. F. M. Sandwith has been elected lecturer in physic in Gresham College in succession to the late Dr. E. Symes-Thompson.

MILITARY MEDICAL VICTIMS TO THE PLAGUE IN CRONSTADT.—The *Novoe Vremya* reports that on March 2nd Dr. Schreiber of the 11th Eastern Siberian Rifles attached to the Military Medical Academy, died from plague which he had contracted in the fort "Emperor Alexander I." at Cronstadt. His remains were incinerated and will be kept in an urn at the fort named. It has been found necessary to state that he was carefully nursed throughout his illness, the contrary having been reported in the press. Unfortunately, although it was hoped that the case was an isolated one, the information is now forthcoming that Dr. Podlevsky of the 3rd Caucasian Rifle Battalion, who was also attached to the Military Medical Academy and was engaged in the anti-plague serum laboratory in the fort named at Cronstadt, has been attacked by the same disease, presumably, says the above journal, whilst conducting the necropsy on the body of Dr. Schreiber. The latest intelligence from the fort is that Dr. Podlevsky is improving in health; his temperature was falling and he was fully conscious.

THE RÔLE OF THE BLOOD PLASMA IN DISEASE.

BY HARRY CAMPBELL, M.D., B.S. LOND., F.R.C.P. LOND.,
PHYSICIAN TO THE NORTH-WEST LONDON HOSPITAL AND TO THE HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, WELBECK-STREET.

V.[1]

IN the last section we arrived at the conclusion that with the exception of genuine senile change disease never sets up spontaneously in a normally evolved cell. Indeed, we may go further and say that when disease arises in a cell it is, except in the case of genuine senile decay, almost always the result of nocuous cell environment.

It is necessary here to attach a precise meaning to the term "cell disease." It has to be remembered in this connexion that the vital activities of the component cells of the organism fall under two heads and we may call them the egoistic and the altruistic. The primary concern of every cell is egoistic, the maintenance, namely, of its own vigorous vitality. Its secondary and, as it were, accidental function, is the altruistic one of administering to the needs of the organism as a whole, whether by controlling and coördinating its activities (neurons), by elaborating ferments and hormones or eliminating poisons (gland cells), or by providing for massive movement (muscle cells). It is true that it is for the most part in the discharge of their normal altruistic functions that the cells find the conditions most suitable to their individual health; but not necessarily so, for it may happen—and I would lay particular stress on this fact—that a cell may fail altruistically and yet maintain a vigorous egoistic life. This may not be the case with such a simple function as muscular contraction; it is probable that failure here necessarily implies some serious affection of the muscle cells, but the altruistic functions of the nerve and gland cells are of a much more subtle nature, and one can well understand how a group of neurons forming, say, a vasomotor centre, might fail in properly regulating the calibre of the vessels which they control, or how, again, glands, such as those of the stomach, of the pancreas, or of the adrenals, might fail in elaborating their ferments and hormones in appropriate quality and quantity; one can well understand, I say, how such nerve and gland cells might fail altruistically and yet, individually considered, maintain a healthy and vigorous vitality. Nay, the very vigour of a cell may constitute an altruistic defect, as when the adrenals yield an excess of adrenalin and thus cause secondary evils (including very possibly atheroma); or when the gastric glands secrete a superabundance of hydrochloric acid, and so give rise to dyspepsia and the many evils which follow in its train; or, again, when in the primipara the mammary glands become from excess of activity unduly turgescent, and thus set up pain and general nervous disturbance.

It is manifest, then, that a cell may gravely fail in some altruistic function and yet, individually considered, be perfectly healthy; only when the cell becomes the seat of actual degeneration (discoverable or not) and thus fails in vital activity, can it be said actually to be diseased. And I repeat that, with the exception of primary senile decay of the cell, disease as thus understood, rarely, if ever, affects the cell spontaneously (i.e., independently of some nocuous influence operating upon it), certainly never if it be normally evolved. But though disease seldom or never occurs spontaneously in the *cell*, it often arises spontaneously in the *organism*. This arises from the fact that though spontaneous cell disease is rare, spontaneous failure in altruistic cell function is unfortunately common enough, and such failure is inconsistent with the health of the organism,[2] interfering, as it does, with that harmonious interaction between the various parts of the body which is necessary to health. Should the disturbance thus resulting be unaccompanied by gross organic change, the cells still preserving their individual health, it is spoken of as "functional"; it may, however, go on to gross organic change, and there is then actual disease (degeneration) of the individual cells.[3] We thus see how *organic disease, involving actual disease of individual cells, may spontaneously break out in the organism, not through the spontaneous occurrence of actual disease in cells, but through a failure in their altruistic function*, and one, moreover, which is perfectly consistent with their individual health; and in point of fact spontaneous organic disease, when not due to primary senile cell degeneration, practically always occurs in this way.

Altruistic cell defects may arise from defect in the constitution of the zygote, or they may be acquired as the result of external influences operating upon the organism to which the zygote gives rise. Only in the former case can the disease resulting from them be said strictly to be spontaneous, for only then can the external environment be wholly exonerated from a share in causation. The condition of the zygote giving rise to altruistic cell defect may be of the nature of a "genetic variation," arising, that is, *de novo*, and in this case the resulting disease would be innate, but not inherited; or it may be hereditary when the resulting disease would not merely be innate but inherited.

It was pointed out in Section I. that the gland cells take precedence of all others in determining the composition of the plasma and the nature of the metabolism in general, a fact which prepares us for the conclusion that it is largely through the gland cells that disease is inherited. Many individuals are from the very beginning of their career defectively endowed in respect of the gastric, pancreatic, adrenal, and other glandular structures. The gland cells in question may be endowed with a vigorous vitality and, individually considered, be perfectly healthy, though defective in one or other of their altruistic functions, and such defects may lead to actual defects in the organism. Where, however, disease results from altruistic cell defect it may not be possible, owing to the close interdependence of the various cells in the body, to say whether that defect is inherent in the gland cells or whether it has been secondarily induced in them through defect, innate or acquired, of some other cells. Sometimes, however, it is manifestly induced. Thus, in Addison's disease the defect of the adrenal glands is often due to tuberculous infection—i.e., to an external agent in the shape of a specific micro-organism. Again, the changes which take place in the thyroid and parathyroid glands in exophthalmic goitre are of a kind most unlikely to occur spontaneously in the individual gland cells; we may, indeed, regard it as certain that they are due to some specific environmental influence brought to bear upon them, probably through altruistic cell defect in some other part of the organism, and in so far as this disease is hereditary it is apparently due, not to any inherited weakness in the thyroid or parathyroid gland cells, but to the inheritance of a defect elsewhere.

The defect in the pancreatic cells on which pancreatic diabetes depends, though it might conceivably be inherent in them from the beginning, is probably always induced, for not only does the pancreas in this disease often show gross organic changes which are clearly not spontaneous, but the disease often begins quite suddenly, and it is well-nigh inconceivable that a multitude of independent cells should at one and the same time fail from purely spontaneous causes. This view does not, however, preclude the possibility of an inherent susceptibility to damage on the part of the affected pancreatic cells. In such a disorder as hyperchlorhydria the case for inherent gland defect appears strong, the fault here consisting in excessive vigour in respect of one particular function—i.e., the secretion of hydrochloric acid.

Perhaps even more potent than the glandular system to set up secondary disease and to transmit inherited disease through altruistic failure of its constituent cells is the nervous system, and there are many reasons why it should be. Not only can the nervous system directly control the activities of the muscle and gland cells which are anatomically connected with its efferent nerves, but it can indirectly control the activities of all the cells in the body through its influence on the composition and circulation of the plasma. Another reason is the extreme structural complexity and delicate organisation of nervous tissue, by virtue of which it is not only more liable than other tissues to structural defect,

[1] Articles I., II., III., and IV. were published in THE LANCET of Feb. 2nd (p. 313), 9th (p. 375), and 23rd (p. 535), and March 16th (p. 754), 1907, respectively.

[2] I am supposing that a sufficient number of cells are involved in the failure, otherwise there would be no appreciable effect upon the health of the organism.

[3] In a former section I spoke of disease as always involving some degree of cell dissolution, even though it is frequently so slight as to be undiscoverable. This referred to disease of the cell. It is, however, possible—theoretically at least—to get a functional disease of the *organism*, one involving simply a want of harmony in its activities, without any necessary cell dissolution. In most functional diseases however, there is some undiscoverable cell dissolution.

but also more impressionable and more vulnerable. The degree of this structural complexity will be the better realised when it is remembered that the individual neurons are of all cells the most highly organised, and further, that the mutual arrangement of contiguous neurons is much more complicated than is that of the constituent cells of other tissues. In the case of such tissues as the muscular and the glandular this relationship is a matter of comparative indifference; contraction and secretion can be carried on quite satisfactorily by each muscle and gland cell independently of its relation to neighbouring muscle and gland cells. In the case of nerve centres, on the other hand, the mutual arrangement of individual neurons is a matter of the highest importance, since it is largely in virtue of the complex inter-relationship of its constituent neurons that the nervous system is able to carry on its controlling and coördinating functions, and it is chiefly also by reason of it that nervous tissue so greatly transcends all others in structural complexity.

The above considerations lead us to infer that many diseases usually regarded as wholly non-nervous in origin actually originate in the nervous system. Such a disease as idiopathic granular kidney affords a possible case in point: the renal degeneration in this affection is certainly brought about through the plasma, and as we have seen that the composition of the plasma is greatly under the control of the nervous system, who knows but the particular plasmic defect on which this affection depends may be traceable to the nervous system? It has also to be borne in mind that defect in one part of the nervous system may be responsible for disturbance in another part of it, and when the characteristic symptoms of the disease are due to this secondary disturbance, the part thus secondarily disturbed may erroneously be regarded as the one primarily at fault. On the other hand, there can be no doubt that spontaneous nervous diseases often do not originate in the nervous system at all, but result from spontaneous altruistic defect in some non-nervous tissue, especially in those engaged in elaborating the plasma, such as the digestive and hormone-forming organs. It is probable that many forms of nervous diathesis originate in this way, the nervous system being perfectly normal to begin with. Consider, for instance, the different effects on the nervous system of a hyper- and a hypo-active thyroid gland: the one gives rise to a restless, nervous, katabolic temperament; the other to one that is sluggish, apathetic, and anabolic.

The foregoing considerations point to the conclusion that spontaneous disease is of two kinds: that in which the cells of the organism become spontaneously diseased (= degenerated) and that in which spontaneous failure in altruistic cell function sets up secondary disease; and further, that with the exception of primary senile cell degeneration, spontaneous disease nearly always arises in the latter way. Indeed, it is difficult to be sure whether non-senile cell disease ever breaks out spontaneously. The most probable instances of its occurrence are afforded by such diseases as Friedreich's disease and the idiopathic muscle palsies, but even in these we cannot be sure that the degenerations characteristic of them break out spontaneously in the affected cells, and that they are not secondarily induced. If they are spontaneous we must conclude that the affected cells have from the beginning of their career been abnormal, but no evidence of such abnormality is at present forthcoming; so far as is at present known the cells which become affected remain up to a certain period perfectly normal; at all events they appear for a time to discharge their functions normally, and this is the only available test of their normality. It is, however, conceivable, that they are from the very beginning defectively endowed; one can conceive, e.g., that in the idiopathic muscular palsies the affected fibres are defective in ferment-forming capacity,[4] and that at a certain stage of their career this defect suddenly becomes emphasised. But if even in the case of such nerve degenerations in which the case for primary spontaneous degeneration appears strongest, we cannot with certainty postulate a spontaneous degeneration of the neurons, what shall we say of the other degenerative affections of the nervous system? I think we may safely conclude that, with the exception of primary senile degeneration of the neurons, they are all secondarily induced, as the result of nocuous environmental agencies operating for the most part through the plasma. Hence in all cases where there is actual disease of the individual cells, be they gland cells, muscle cells, neurons, or what not, we should suspect the operation on them of some nocuous influence. This may be either plasmic or non-plasmic, the former playing much the larger part.

Constitutional disease.—When in a disease the blood plasma is disordered and this plasmic affection gives rise to any of the essential phenomena of the disease, we speak of it as a constitutional, or blood disease. In many cases of this kind—e.g., gout, tabes dorsalis, peripheral neuritis, the specific fevers, and all other recognisable bacterial disorders—we have no difficulty in recognising the disease as being essentially plasmic in nature; but if my conclusions as to the rarity of spontaneous cell disease be correct, and as to the wide rôle played by the plasma in inducing cell disease, it is obvious that there must be many diseases belonging to this category in which the plasmic origin is overlooked. Some of these I now propose to consider—namely, paralysis agitans, granular kidney, Graves's disease, myxœdema, Addison's disease, acromegaly, diabetes, and insanity.

Paralysis agitans is generally looked upon as a primary affection of the nervous system. Although no definite nervous degeneration is found in association with this disease it is impossible to doubt that the nervous system is profoundly affected in it; and, indeed, no one can observe a series of these cases without convincing himself that he is dealing with a constitutional affection involving not only the nervous system but other tissues as well, and that all the essential phenomena of the disease are plasmically induced. Paralysis agitans is, in fact, a generalised symmetrical affection of a kind which could only be produced through the plasma. It is true that the characteristic tremor often begins hemiplegically, but this is only one among many symptoms of the disease, and even more constant than the tremor, and always in my experience antedating it, is the muscular rigidity, which is always symmetrical. Now are we to suppose that each of the countless cells, nervous and non-nervous, which are disordered in this disease, spontaneously and synchronously takes on morbid action? Or are we to suppose that a common nocuous influence is brought to bear upon them, forcing them to disordered action? Surely the latter is the correct assumption. Now there is only one medium through which this common influence can act—i.e., the plasma.

I recently saw a case which is interesting in this connexion. The patient was said to be suffering from a nervous disease which had been variously diagnosed by various physicians. After her medical attendant had given me a brief description of the case I said to him, "I do not expect to be able to give the disease a name, but I have little doubt from what you have told me that it is essentially a plasmic disease, one in which the plasma is profoundly affected." The patient was a woman, aged about 50 years. She was sitting in the middle of a drawing-room, propped up in an invalid's chair. She did not stir as I entered the room but continued to gaze steadily in front of her; nor did she once turn her face when she spoke, and all her conversation was in slow measured tones. She was anæmic and emaciated and displayed considerable rigidity in the muscles of the neck and trunk and some also in the legs. She complained of pain in several joints, some of which were swollen, and of shooting pains in her extremities, with numbness and anæsthesia in her hands and feet. There was no tremor. What was the diagnosis? I said to the medical attendant: "It is, as I anticipated, useless to attempt to give any one name to this disease. The central fact to bear in mind is that it is a plasmic disease. The blood is in a very bad way, for not only is it impoverished, as shown by the marked anæmia and emaciation, but poisoned, and probably also defective in respect of its hormonic constituents; we have in consequence to deal with a symptom-complex which may be described as a blend of several diseases in atypical form—to wit, hysteria, peripheral neuritis, rheumatoid arthritis, and paralysis agitans." The patient had, in point of fact, all these diseases. Now I venture to think that it would be impossible to grasp the real significance of such a case as this were the part played by the blood plasma in disease not kept clearly in view. And in connexion with this case I would recall the remark made in a previous section as to the utter impossibility of giving a special name to every case of disease which comes before us. In the case in question the plasma was defective in divers ways, and, as so frequently happens, the patient was afflicted with an illness which was a complex of many disorders.

[4] I refer here to those muscle ferments which are needful to the normal nutrition of the muscle bioplasm.

Here I would point out that it must not be supposed that because in any disease, nervous or other, the parts are not affected symmetrically the disease is not therefore of plasmic origin. It is true that all plasmically induced diseases, be they functional or organic, tend to be symmetrical, the plasmic poisons—when there is toxæmia—picking out the corresponding cells on each half of the body, but there is never complete symmetry; sometimes, indeed, there is decided asymmetry. This may be partly explained by the fact that the poison is not equally distributed to all parts of the body, but probably better by the fact that corresponding parts on the two sides are not necessarily identical in structure. I have myself seen uræmic convulsions confined to one side of the body, and it is well known that the tremor of paralysis agitans, which (as I have sought to show) is a plasmic disease, generally starts hemiplegically, while differences in the involvement of the two sides of the body can practically always be made out in such unmistakeably plasmically induced diseases as tabes dorsalis and peripheral neuritis. We must not, therefore, assume that because a disease is not strictly symmetrical it is not of plasmic origin. Not only may the two sides of the body not be symmetrically affected, but among a group of similar cells on one side some may be affected more than others: in progressive muscular atrophy, e.g., some of the neurons belonging to one particular muscle hold out much longer than others; indeed, of two adjacent neurons one may be apparently intact when the other is destroyed; in acute yellow atrophy, again, apparently healthy liver cells may be mixed up with the débris of dead ones, while even in advanced granular kidney some of the renal epithelia seem to be wholly unaffected.

Granular kidney affords an admirable instance of a disease in which the essential lesion (i.e., renal degeneration) and the chief clinical manifestations are produced through the plasma. There are no grounds for assuming that the renal degeneration which occurs in this disease is spontaneous. When the disease is caused by gout or lead poisoning it is acknowledged by all that the renal change is plasmically induced, and one would expect this also to be the case when it occurs idiopathically, as it may do, in those living under perfectly healthy conditions, and that, too, quite early in life. It is at least highly improbable that multitudes of independent renal cells should spontaneously begin to degenerate in exactly the same way at one and the same time; much more likely is it that even in these so-called idiopathic cases some nocuous influence is at work on the renal cells. This influence must be either nervous or plasmic, and as there is no evidence that the characteristic renal changes can be brought about by the direct action of the nervous system, we must assume that they are produced through the plasma. Apparently the blood in this disease contains a substance which is destructive to the renal epithelium; we must assume that this nephrolysin results from some chronic metabolic disturbance in some tissue or tissues unknown, and that in this way the plasma is furnished with a constant supply of the poison, for granular kidney is always progressive—once started it continues with such fatal persistence to the end.

Just as the renal changes of granular kidney are plasmically induced, so also are the general manifestations of the disease—e.g., the high blood pressure, the cardio-vascular changes, the tendency to inflammations, and the not infrequent anæmia and cutaneous pigmentation. How far these effects are due to the primary plasmic defect which is responsible for the renal degeneration, how far to the retention in the blood of effete products consequent upon that degeneration, or how far to the absorption into it of broken-down renal epithelium, which is known to be capable of sending up the blood pressure,[5] we cannot say. One thing is, however, certain—i.e., that all the essential phenomena of the disease are produced through the blood plasma. It seems very doubtful whether failure in the excretory functions of the kidneys enters into the causation of the disease at all, except during the later stages, inasmuch as all its characteristic phenomena are observed long before the kidneys begin to show signs of failure.

As I have already hinted, aberrations of hormonic function probably figure largely in disease, though we as yet know but little concerning them. There are, however, certain well-defined diseases which can be more or less definitely traced to disease in some hormone-producing tissue. Such are Graves's disease, myxœdema, Addison's disease, and acromegaly. In regard to myxœdema and Addison's disease, few will be prepared to deny a hormonic causation; there are some, however, who are less inclined to admit that the chief phenomena of Graves's disease are due to an altered state of the blood plasma consequent upon the faulty action of the thyroid or parathyroid glands; or, again, that the characteristic phenomena of acromegaly are secondary to disease of the pituitary body. But whatever view we may hold as to the exact pathology of these four diseases, there can be no doubt that their essential phenomena are produced through the plasma, inasmuch as there is no other medium capable of bringing them about. Myxœdema is now acknowledged by all to be a plasmic disease; but even if we had not practical evidence of the fact in the shape of a diseased or absent thyroid, and of the beneficial effect produced in this affection by administering thyroid extract, we might on *a priori* grounds safely infer its plasmic origin: only through the plasma could the generalised modification in nutrition characteristic of it be produced. Only through this medium, again, could the characteristic phenomena of Graves's disease—such as the rapid metabolism, the emaciation, sweating, pigmentation, and agitation—be produced. Addison's disease is so obviously an affection of the blood that there is hardly need to advance proof of the fact. The occurrence of pigmentation alone attests it, and it is manifest that the nutrition of the tissues generally is profoundly affected in this disease; moreover, the great fall in the blood pressure observed in it is just what one would expect to get in a disease having as a constant accompaniment degeneration of a tissue known to yield a powerful vaso-constrictor substance. Exactly the same arguments apply to acromegaly: only through the blood would it be possible for its characteristic anatomical changes to be set up. There is no medium other than the plasma capable of producing a widespread symmetrical overgrowth of osseous and fibrous tissue, and it is scarcely conceivable that some billions of cells should spontaneously take on this morbid form of activity. Apart from these considerations we have in acromegaly unmistakeable evidence of blood alteration in the shape of pigmentation, sweating, and other cutaneous phenomena. The nutritive changes met with in this disease are, in fact, just as certainly plasmic in origin as are those which characterise puberty.

Diabetes is manifestly another plasmic affection: the plasma contains a superabundance of grape sugar. It is probable, however, that it is a plasmic affection in another sense, not merely, that is, in respect of the excess of sugar, but in the sense (in many cases at least) that some initial antecedent defect of the plasma is responsible for the hyperglycæmia. This conclusion can be arrived at *a priori*.

I have already advanced arguments in favour of the view that in pancreatic diabetes the disorder of the pancreatic cells which causes the diabetes is due to a nocuous influence operating on them. This nocuous influence almost certainly works through the plasma. But however the cells of the pancreas be disordered, it is evident that the disease of them can only cause diabetes in one way—i.e., through the plasma, by so altering its composition as to interfere with the normal metabolism of saccharide material. It is certain that the hyperglycæmia, whether secondary to the disease of the pancreas or some other organ, results from some peculiar condition of the plasma. In all cases of genuine diabetes there sooner or later comes a time when sugar is passed in the urine, even though all carbohydrates are omitted from the food, and, indeed, when food is withheld altogether. The sugar in such cases can only have one source—i.e., the tissues—and we must either assume that the plasma so influences these as to compel them to yield sugar in abnormally large quantities or that it is deficient in some substance needful for the utilisation of sugar; in other words, we are compelled to assume that the essential cause of diabetes lies within the plasma. I see no grounds for assuming, as some do, that the pathology of diabetes in the early phases of the disease, when the glycosuria can be eluded by withholding carbohydrates, is different from what it is in its later phases.[6] It is essentially the same throughout. "We may conclude, in short, that genuine diabetes mellitus is from the beginning to the end of its course due to a faulty condition of the blood,

[5] H. Batty Shaw has advanced evidence in favour of this view. He concludes that "kidney substance can alone be the cause of the rise of blood pressure met with in renal disease," Goulstonian Lecture III., THE LANCET, May 26th, 1906, p. 1461.

[6] Pavy holds that the presence of sugar in the blood causes the protoplasm of the tissues to break down into sugar. "On Carbohydrate Metabolism," F. W. Pavy, M.D. Lond., LL.D., F.R.S. 1906.

leading to a faulty metabolism of sugar, and one can hardly doubt that this faulty blood state is due to defective metabolism of some tissue or tissues which normally yield to the blood something which is essential to the normal metabolism of sugar. During the early phases of the disease the specific blood defect is comparatively slight, so that the glycosuria can be held in check by curtailing the carbohydrate diet, but during the latter phases it is so pronounced that glycosuria occurs even during complete starvation." This passage in inverted commas was written in ignorance of the most recent expert opinion on the physiology of sugar metabolism and was arrived at deductively. It was therefore with great interest that I read the latest pronouncement on the subject by an accomplished physiologist: "The primary cause of the accumulation of sugar in the blood in pancreatic diabetes is the withdrawal from the blood of some internal secretion yielded by the pancreas necessary for the utilisation of dextrose,"[7] and later the same authority adds that there can be no doubt "that a want of destruction of dextrose must be the cause of the glycosuria." Pavy, on the other hand, attributes pancreatic diabetes to the absence from the plasma of something needful for the assimilation rather than for the destruction of carbohydrate.[8] It will, however, be observed that on either view pancreatic diabetes results from a plasmic defect.

We have seen that all the characteristic symptoms of insanity can be produced by certain substances (such as drugs and bacterial poisons) operating through the plasma; and also that alterations in the hormonic constituents of the plasma (such as happen, e.g., in Graves's disease) may cause virulent "nervousness." Facts such as these prepare us for the conclusion that insanity may be plasmically induced; and there is unmistakeable evidence that this is actually the case. Thus insanity is known to be sometimes caused by chronic alcoholism, and by the specific fevers, in which cases the essential cause obviously operates through the blood; and there can be no doubt that many other forms of mental disease are similarly induced. Indeed, it is probable that most cases of insanity, other than those due to such causes as trauma, some cases of tumour, and primary senile degeneration, are essentially plasmic in origin.

We are compelled to assume that with the exception of cases of this kind the plasma takes some part in the causation of all those cases of insanity in which gross structural changes are met with in the cerebral neurons; for on the principle already laid down such changes must be due to some noxious influence operating upon the affected neurons, and nervous influence being incompetent to bring them about we can only conclude that they are produced through the plasma.

When pronounced structural changes have taken place in the brain complete recovery from insanity is impossible; but in the absence of such changes there may be complete recovery. As in the former cases, so in the latter, we must assume the existence of a noxious environment operating upon the disordered neurons, for we may lay it down as an axiom that *spontaneous disorder and spontaneous recovery of a cell are incompatible*. Such an occurrence would imply an inherent tendency on the part of the disordered cell spontaneously to deviate from the normal at a certain point in its vital cycle and at a later period spontaneously to recover—an assumption for which there is no kind of warrant. Recovery from a disease is *ipso facto* proof that the disordered state of the cells responsible for it has been induced in them through their environment.

The noxious influences which may so disturb the cerebral neurons as to cause insanity may be either plasmic or non-plasmic, or a combination of both; but as a matter of fact all the non-plasmic causes, other than tumour and trauma, operate chiefly and essentially through the plasma. Among them may be mentioned mental causes (e.g., excitement, suspense, fear, and excessive intellectual effort), and such reflex causes as eye-strain. Now all the mental causes mentioned lead to marked plasmic alteration, upsetting as they do digestion and the functions of internal secretion and excretion; they may, indeed, modify the composition of the plasma and the metabolism of the entire organism in an incredibly short space of time; fear, for instance, may in a few moments lead to a perceptible change in the odour of the sweat and breath. The reflex causes of insanity probably also act largely by influencing the plasmic environment of the cortical neurons. Thus, when severe eye-strain is the starting point, as it actually may be, it probably acts chiefly by disturbing the general health and thus modifying the composition of the plasma; it may conceivably act also by reflexly causing vaso-motor disturbance of the brain, and in this way interfering with the proper circulation of the plasma.

We thus see that the blood plasma plays a preponderating part in the causation of insanity; and it is probable that when there is an innate tendency to this affection, it is rather because of an innate tendency for the plasma to become disordered in a way calculated to set it up, than because of an innate tendency on the part of the cortical neurons to become spontaneously disordered. In suggesting this I am not denying that the cerebral organisation may be such as to predispose to insanity.

Doubtless many of the plasmic changes which take place in chronic insanity develop in the course of the disease and are not responsible for the primary outbreak, though necessarily adding their quota to the clinical picture of the disease. Such plasmic changes result inevitably from the constant action and reaction taking place between the blood and the tissues. There can, however, be little doubt that in most cases of insanity the blood is from the very beginning of the disease specifically altered, and that this specific blood state is its essential cause. It is probable that the most sane individual would become insane if his brain were constantly fed with the blood of a chronic lunatic, and not only so, but that he would suffer from the same kind of insanity; just as, contrariwise, it is probable that in most cases of insanity without serious brain disorganisation the constant feeding of the brain with healthy blood would effectually re-establish the normal mental balance.

Summary.—The functions of the component cells of the organism may be considered from the egoistic and the altruistic standpoint, and it is possible for a cell to fail altruistically and yet possess a vigorous vitality, and thus, considered individually, be free of disease; a cell cannot be said to be actually diseased unless it degenerates and fails in vitality. *Cell* disease as thus defined rarely occurs spontaneously in the cell. Spontaneous disease in the *organism* is, however, quite common and, when it occurs, generally results from altruistic failure in cell function, interfering with the normal harmonious interaction between the various parts of the body, and thus causing functional or even organic disease.

(To be continued.)

[7] Recent Advances in Physiology, &c. Edited by Leonard Hill. Pp. 312-384.

[8] Op. cit., pp. 70 et seq.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary meeting of the Council was held on March 14th, Mr. HENRY MORRIS, the President, being in the chair.

Mr. J. Ernest Lane was introduced and having made a declaration in the terms of the oath prescribed by the Charter of 1800 was admitted a member of the Court of Examiners.

The PRESIDENT reported the death on Feb. 19th of the Hon. Sir William Hales Hingston, M.D., LL.D., D.C.L., of Montreal, an honorary Fellow of the College, and he stated that he had written to Lady Hingston to express the sympathy and condolence of the Council.

The PRESIDENT reported the delivery of the Erasmus Wilson lectures by Mr. Willmott H. Evans, Mr. Reginald Cheyne Elmslie, and Mr. Kenneth W. Goadby. He also reported the delivery of the Hunterian oration by Mr. Henry T. Butlin. The best thanks of the Council were given to Mr. Butlin for his oration and he was requested to publish it. The President also reported the delivery of the Arris and Gale lectures by Mr. J. F. Dobson and Dr. Bertram L. Abrahams. The President further reported the delivery of the Hunterian lectures by Mr. W. Sampson Handley, Mr. J. W. Thomson Walker, and Mr. J. Howell Evans. The President reported that Mr. William Wright's Hunterian lectures had been unavoidably postponed owing to his illness.

The PRESIDENT stated that in pursuance of the Bradshaw bequest he had chosen Mr. Rickman J. Godlee as Bradshaw lecturer for the ensuing collegiate year.

Sir Gilbert Blane's medals were awarded to Staff Surgeon James William Wilcocks Stanton, R.N., for his journal of

H.M.S. *Suffolk*, 1905, and to Surgeon Bernard Ley, R.N., for his journal of H.M.S. *Algerine*, 1904.

Mr. A. Pearce Gould was re-elected as representative of the College upon the Senate of the University of London.

Dr. J. Ward Cousins was re-elected as representative of the College on the Central Midwives Board.

It was announced that a letter had been received from the secretary of the London School of Medicine for Women, inclosing a list of 2708 signatures in support of the petition to the Council in favour of the admission of women to the examinations of the College.

A letter was read from Dr. Arthur Keith reporting his attendance as the representative of the College with the deputation to the Prime Minister to urge the importance of a national anthropometric survey, and giving a short account of the grounds upon which the importance of this survey was urged and of the reply of the Prime Minister. A vote of thanks was accorded to Dr. Keith for his services as the representative of the College.

Looking Back.

FROM

THE LANCET, *SATURDAY*, March 21st, 1829.

YELLOW FEVER AT GIBRALTAR.

This formidable epidemy has at last ceased to rage; and, since the 16th of January, it has been deemed unnecessary to enforce any longer the quarantine, and the other sanitary measures. The number of patients who were affected with the yellow fever, amounts to 5,270, to which, it appears, no less than 1300 must be added, who were not entered in the official accounts; 1412 of the above number were soldiers, and amongst them the mortality was 1 to 3·41; amongst other patients, it was only 1 to 4·15; the absolute number of deaths was 1658.

M. Chervin, whose researches on the nature of yellow fever have been given in a former number of THE LANCET, was sent by the Académie Royale de Médecine of Paris to Gibraltar, in order to observe the epidemy. In his last communication to the Académie, he declares the disease at Gibraltar to be identical with the yellow fever of the West Indies; and asserts, that the most scrupulous investigations he made, during his stay at Gibraltar, with respect to the contagiosity or non-contagiosity of the disease, have only contributed to confirm his former opinion on the subject. M. Chervin was accompanied by M. Louis, who, soon after his arrival at Gibraltar, had a slight attack of the disease, from which he recovered within a short time. As soon as the official report of MM. Chervin and Louis has been laid before the Académie Royale, an extract of it shall be given to our readers.

SUBSTITUTE FOR HOPS.*

To the Editor of THE LANCET.

SIR,—In THE LANCET, No. 287, (Feb. 28, 1829,) it is stated that Mr Yosy made a communication to the Medico-Botanical Society, respecting the use of the common buck-bean, or marsh-trefoil, as a substitute for hops, and for which they presented him with their silver medal. I can attest as to its proving an excellent succedaneum in this respect; for, about the year 1820, when hops were at an exceedingly high price, I prepared a considerable quantity of *extract* from the plant, of which I sold a great deal.

If I be correct in my remembrance, a small pill box full, containing nearly two drachms, was considered equal to one pound of hops. What tends, in some degree, to establish the approval of the article in the process of brewing is, that they were private householders only who purchased it.

I am, Sir,
Your obedient servant,
L. TOWNE.

March 10, 1829.

* Vide "Looking Back" in THE LANCET of March 2nd, 1907.

Public Health and Poor Law.

LOCAL GOVERNMENT BOARD.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

Guildford Borough.—The town council has built 18 cottages which are now let at from 6*s.* 6*d.* to 7*s.* 6*d.* weekly, the total cost of such cottages having been £4266. Dr. R. W. C. Pierce states that it has not been found possible to build cottages to let at about 5*s.* weekly, the maximum amount which a labourer can afford to pay, and thus, he adds, the housing problem has not yet been solved. The larger of the cottages referred to above have each a living room, kitchen, scullery, and three bedrooms; in the smaller the kitchen is omitted. Dr. Pierce does not discuss the important question as to the percentage which a town council trading in houses may reasonably expect to obtain, but it would not appear that a weekly rental of £6 5*s.* for 18 cottages which cost £4266 is altogether a bad return. The council decided to allow a letter from the Kingston guardians asking the council to petition the Local Government Board to make pulmonary tuberculosis notifiable in a compulsory sense to lie on the table.

Guildford Rural District.—Steps were taken by the medical officer of health of this district in 1906 to prevent the overcrowding of cottages by London holiday children and by means of a circular sent to persons responsible for the despatch of the children it was urged that all should be carefully examined before leaving London and that pains should be taken to insure that they could be provided with at least 300 cubic feet of space in the cottages to which they were going. During the summer two cases of scarlet fever occurred amongst gipsies who were fruit-picking, these gipsies visiting the neighbourhood for strawberry and raspberry gathering. Apparently the custom obtained locally some years ago of commencing the summer holidays at an earlier period in order that both parents and children might do the work. Dr. Pierce thinks that this arrangement was a good one in that it enabled the local people to obtain healthy employment and also prevented the introduction of undesirable labourers.

Maldon Rural District Council.—The housing problem in rural districts is of such interest that any details relative thereto are helpful even when they record nothing but financial failures. Dr. J. C. Thresh tells us that Mr. Fels, whose name is so honourably associated with attempts to deal with the housing problem, has purchased a farm in this district and divided it into holdings of from five to ten acres each. 26 houses are to be built and 14 of them are already occupied, there being in connexion with the cottages a range of glass-houses for the use of the tenants. Apparently the rent for each holding is about £24 per annum. The experiment, which was, it appears, carried out by the district council at Bradwell, has not been altogether a brilliant success. The six cottages which were erected in 1904 cost £1450, and the annual payments amount to £81 2*s.* 9*d.* in connexion with repayment of the loan and £14 13*s.* for rates and repairs. As the rents only amount to £54 12*s.* there is a deficit of £41 3*s.* 9*d.* to be met by the rates, and this amounts to 2¾*d.* in the £.

Chelmsford Rural District.—A somewhat startling outbreak of arsenical poisoning occurred in this district during 1906 and it illustrates a method of poisoning by this drug which was not contemplated by the Royal Commission on Arsenical Poisoning. A publican supplied beer to a purchaser in a gallon stoneware bottle and on the same day five persons who partook of such beer were attacked with sickness, diarrhœa, and abdominal pain in from ten minutes to two hours afterwards. On the following day those who had consumed some of the beer and then suffered gave the remainder, apparently with no criminal intent, to a neighbour, and three persons who drank it were taken ill afterwards. On examining the bottle Dr. Thresh found, he states, the lower part and bottom thickly encrusted with crystals of white arsenic, and this notwithstanding the fact that the landlord had scalded the bottle before using it. In the half-pint of beer which was left in the bottle when Dr. Thresh broke it there were found 30 grains of arsenic in solution. It is added that the beer when taken on the first day must have contained about four grains of arsenic to the

pint, and, on the second day, as much as ten grains. In these circumstances it is, indeed, very remarkable that no fatal results ensued, as each person, we are told, had one or two glasses.

Taunton Urban District.—Dr. H. J. Alford reports that through the generosity of three local residents three beds at the Winsley Sanatorium for Consumption have been placed at the disposal of the town. This sanatorium was erected for the use of the three counties of Somersetshire, Gloucestershire, and Wiltshire, and a large number of the beds, including, we believe, 20 by the town council of Bristol, have been subsidised.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 76 of the largest English towns 8507 births and 5476 deaths were registered during the week ending March 16th The annual rate of mortality, which had been equal to 18·4 and 18·2 per 1000 in the two preceding weeks, further declined to 17·8 in the week under notice. During the first 11 weeks of the current quarter the death-rate in these towns averaged 19·3 per 1000, the rate during the same period in London being 19·6. The lowest death-rates in the 76 towns during the week were 6·4 in Hornsey, 8·8 in Burton-on-Trent, 10·7 in Coventry, and 11·0 in Northampton; the rates in the other towns ranged upwards to 23·4 in Sunderland, 23·8 in Birkenhead, 24·2 in Huddersfield, and 26·5 in Plymouth. The 5476 deaths in the 76 towns showed a further decline of 129 from the numbers returned in the two previous weeks, and included 465 which were referred to the principal epidemic diseases, against 440 and 470 in the two preceding weeks; of these, 199 resulted from measles, 114 from whooping-cough, 60 from diphtheria, 39 from diarrhœa, 34 from scarlet fever, 19 from "fever" (principally enteric), and not one from small-pox. The deaths from these epidemic diseases were equal to an annual rate of 1·5 per 1000 in the 76 towns, the rate from the same diseases being also 1·5 in London. No death from any of these epidemic diseases was registered in Plymouth, Southampton, Halifax, Swansea, or in 12 other of the 76 towns; the annual rate therefrom, however, ranged upwards to 5·3 per 1000 in Portsmouth and Birkenhead, 7·0 in Hanley, and 8·5 in St. Helens. The 199 fatal cases of measles showed a slight decline from the number in the previous week, but caused an annual rate of 4·3 in Portsmouth, 4·4 in Birkenhead, 4·5 in West Bromwich, and 6 8 in St. Helens. The 114 deaths from whooping-cough showed an increase, the highest annual rates therefrom being 1·2 in Nottingham and in Rhondda, and 1·3 in Tottenham. The 60 deaths referred to diphtheria were fewer by nine than those in the previous week, but showed a considerable proportional excess in Hanley and Barrow-in-Furness. The three deaths from scarlet fever in Hanley were equal to an annual rate of 2·6. The deaths from "fever" were considerably below the average; one death of a child was referred to cerebro-spinal fever in London. No case of small-pox has been under treatment in the Metropolitan Asylums Hospitals since the end of June last. The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and in the London Fever Hospital, which had steadily declined in the 11 preceding weeks from 3846 to 2878, further fell to 2826 in the week under notice; 327 new cases of this disease were, however, admitted to these hospitals during the week, against 326 and 306 in the two previous weeks. The deaths in London referred to pneumonia and other diseases of the respiratory organs, which had been 432 and 405 in the two preceding weeks, further declined to 403 in the week under notice, but exceeded the corrected average number in the corresponding week of the last five years by 35. The 26 deaths referred to influenza in London were eight below the corrected average. The causes of 62, or 1·1 per cent., of the deaths registered during the week were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in London, Leeds, West Ham, Nottingham, Salford, Leicester, and in 49 other of the 76 towns; the proportion of uncertified deaths, however, again showed a marked excess in Liverpool, Birmingham, Preston, Sunderland, and South Shields.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in eight of the principal Scotch towns, which had been equal to 20·3 and 20·6 in the two preceding weeks, declined again to 20·5 in the week ending March 16th, but exceeded the mean rate in the 76 English towns by 1·9. The rates in the eight Scotch towns ranged from 13·2 and 17·9 in Dundee and Aberdeen to 21·0 in Perth and 23·5 in Glasgow. The 712 deaths in the eight towns showed a decline of four from the number in the previous week, and included 100 which were referred to the principal epidemic diseases, against 98 and 112 in the two preceding weeks. These 100 deaths were equal to an annual rate of 2·9 per 1000, which exceeded by 1·4 the rate from the same diseases in the 76 English towns; they included 43 which were referred to "fever," 33 to whooping-cough, 13 to diarrhœa, six to measles, four to diphtheria, one to scarlet fever, and not one to small-pox. The deaths referred to "fever," which had been 47 and 52 in the two previous weeks, declined last week to 43, and included 35 in Glasgow, two each in Edinburgh, Leith, and Greenock, and one each in Aberdeen and Paisley; 33 of the 35 deaths from "fever" in Glasgow, and all those recorded in Edinburgh, Leith, Greenock, and Paisley, were certified as cerebro-spinal meningitis. The 33 fatal cases of whooping-cough, showed a further increase upon recent weekly numbers, and included 22 in Glasgow, four in Aberdeen, four in Greenock, and three in Edinburgh. Nine of the 13 deaths attributed to diarrhœa occurred in Glasgow and two in Edinburgh. Of the four fatal cases of diphtheria, three were returned in Glasgow; and four of the six deaths from measles in Edinburgh. The deaths in the eight towns referred to diseases of the respiratory organs, including pneumonia, which had been 124 and 149 in the two preceding weeks, further rose to 155 in the week under notice, and exceeded the number in the corresponding week of last year by 32. The causes of 29, or 4·1 per cent., of the deaths registered in the eight towns during the week were not certified or not stated; the percentage of uncertified deaths in the 76 English towns during the same week did not exceed 1·1.

HEALTH OF DUBLIN.

The annual death-rate in Dublin, which had been equal 28·6 and 25·2 per 1000 in the two preceding weeks, further declined to 24·9 in the week ending March 16th. During the first 11 weeks of the current quarter the death-rate in the city averaged 28·0 per 1000; the mean rate during the same period did not exceed 19·6 in London and 19·9 in Edinburgh. The 187 deaths of Dublin residents registered during the week under notice showed a further decline of two from the numbers in recent weeks, and included 16 which were referred to the principal epidemic diseases, against nine and ten in the two previous weeks. These 16 deaths were equal to an annual rate of 3·1 per 1000, and included five from whooping-cough, four from measles, four from diarrhœa, one each from scarlet fever, diphtheria, and "fever," and not one from small-pox. The fatal cases of whooping-cough showed a decline, while those of measles exceeded the numbers in recent weeks. One death was also referred to cerebro-spinal fever. The deaths in the city included 39 of infants under one year of age and 52 of persons aged upwards of 60 years, showing an increase upon the numbers in the previous week. Four deaths from violence and four inquest cases were registered; and 72, or 38·1 per cent., of the deaths occurred in public institutions. The causes of ten, or 5·3 per cent., of the deaths registered during the week were not certified; the percentage of uncertified deaths in the week under notice was equal to 5·7 in Edinburgh, while all the deaths were duly certified in London. The 156 deaths registered in Belfast during the week ending March 16th included 20 deaths certified as due to cerebro-spinal meningitis or cerebro-spinal fever.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet Surgeon T. C. Meikle to the *Natal* on commissioning. Staff-Surgeons: J. E. H. Phillips to the *Victory*, additional, to be lent to Haslar Hospital, temporary; F. C. B. Gittings to the *Natal*, on commissioning. Surgeons: G. C. Cross to the *Wildfire*, additional, for Sheerness Yard; A. D. Spalding to

the *Wildfire*, additional, for the *Endymion*; C. E. C. Stanford to the *Argonaut*, and on recommissioning; G. L. Buckeridge to the *Victory*, additional, to be lent to Portland Hospital.

Deputy Inspector-General of Hospitals and Fleets Robert Bentham has been placed on the retired list, with permission to assume the rank of Inspector-General of Hospitals and Fleets (dated March 17th, 1907).

ROYAL ARMY MEDICAL CORPS.

Captain G. E. F. Stammers has been selected for duty in connexion with the revision of the manual for the Royal Army Medical Corps.—Captain C. E. Fleming, from the Dublin district, has been posted to the Cork district for duty at Templemore, and Lieutenant-Colonel T. F. MacNeece from Cork has been selected for appointment as an Administrative Medical Officer at Chatham.—Lieutenant-Colonel E. Eckersley and Lieutenant-Colonel C. L. Josling have joined the London district for duty.

Lieutenant-Colonel George Scott retires on retired pay (dated March 20th, 1907).

Lieutenant-Colonel William Dugdale retires on retired pay (dated March 16th, 1907).

INDIAN MEDICAL SERVICE.

The King has also approved of the retirement from the service of the undermentioned officers:—Lieutenant-Colonel Edward Pettingall Youngerman (dated March 2nd, 1907) and Captain Hugh Bixby Luard (dated March 15th, 1907).

VOLUNTEER OFFICERS' DECORATION.

The King has conferred the Volunteer Officers' Decoration upon the undermentioned officers of the Volunteer Force, who have been duly recommended for the same under the terms of the Royal Warrant dated July 25th, 1892:—

Southern Command (Rifle): 2nd Volunteer Battalion the Duke of Cornwall's Light Infantry: Surgeon-Major and Honorary Surgeon-Lieutenant Colonel William Nettle.

Eastern Command (Medical Corps): Royal Army Medical Corps (Volunteers), Sussex and Kent Bearer Company: Lieutenant-Colonel James Turton (Brigadier-Surgeon-Lieutenant-Colonel, Senior Medical Officer, Sussex and Kent Volunteer Infantry Brigade).

Western Command (Rifle): 5th Volunteer Battalion the Cheshire Regiment: Surgeon-Major Charles Averill. 2nd Volunteer Battalion the Welsh Regiment: Surgeon-Lieutenant-Colonel David Hepburn.

Scottish Command (Rifle): 4th (Donside Highland) Volunteer Battalion the Gordon Highlanders: Surgeon-Major Alexander Nicol.

London District (Medical Corps): Royal Army Medical Corps (Volunteers); London District, London Companies: Lieutenant-Colonel and Honorary Colonel Valentine Matthews.

DEATHS IN THE SERVICES.

Surgeon-General Sir John Harry Ker Innes, K.C.B., A.M.D. (retired), at his residence in Florence on March 12th. He entered the Medical Department of the Army in 1842 and in 1854, his regiment being then in India, he went to the Crimea as a volunteer and took part in the attack on the Redan. He served in India during the Sepoy revolt, when he was wounded. He was present at the storming of the heights before Delhi and at the capture of that city. As principal medical officer he went through the Rohilkund campaign and during the Franco-German war he acted as British Medical Commissioner on the staff of the Crown Prince of Prussia, for which services he received from the Emperor the Steel War Medal and Iron Cross. He was principal medical officer of the Afghan campaign in 1878–79. He retired in 1880. We hope to publish an obituary notice of this distinguished officer in an early issue.

THE ARMY ESTIMATES.

The *Broad Arrow* of last week, in an article analysing the Army Estimates for 1907–08, contains the following:—

> In Vote 2, Medical Establishment, Pay, &c., there is a net decrease of £30,000, there being a reduction in pay of £11,600 in the Army Medical Service, £11,100 for civilian practitioners, £2800 for Army Nursing Service, and £3600 for clerks and other subordinates. The cost of medicines is reduced by £1000 and miscellaneous appropriations in aid by £100, the only increase shown being £200 for the expenses of the Royal Army Medical College in which the commandant and some of the professors have been awarded an increase of pay.

ENTERIC FEVER AT FLEETWOOD.

The *Standard* of March 19th contains the following:—"The Secretary of State for War has forwarded to the Fleetwood urban council a communication in which he refuses to allow the publication of the official report on the outbreak of enteric fever at Fleetwood Camp, by which two officers lost their lives last summer. Mr. Haldane has, however, followed this communication by a telegram, in which it is stated that the cause of the outbreak was due to the presence in the officers' mess of an unsuspected case of enteric fever in the person of a civilian waiter, named Joyce. It is expected that an animated discussion on the subject will take place at the next council meeting. It will be remembered that the affair caused a considerable sensation in Lancashire last August. Two officers of the 3rd Battalion Loyal North Lancashire Regiment succumbed to the disease and it was freely hinted that the water-supply of Fleetwood was contaminated. This insinuation the local council hotly denied, asserting that their supply was amongst the finest in England, and that if there was any defect in the supply at the camp it was the fault of the War Office authorities and not of the urban council."

Correspondence.

"Audi alteram partem."

CASTING UP ACCOUNTS IN CONNEXION WITH MALARIA.

To the Editors of THE LANCET.

SIRS,—It will be my duty in the autumn of this year to present a report to the International Congress of Hygiene at Berlin on the progress of anti-malaria measures in British possessions and, if possible, in America. Ten years will then have elapsed from the date when the parasites of malaria were first discovered in gnats; and I should therefore like to give as complete and trustworthy an account as possible of all that has been done against the disease during that period. From official publications, articles in the medical press, and private letters, I gather that campaigns have been at least commenced in the following localities: Freetown, Lagos, Gambia, Gold Coast, Hong-Kong, Federated Malay States, Andamans, Candia, Khartoum, Trincomalee, Port Said, Natal, Mian Mir, Peshawur, Rawalpindi, Sialkote, Ferozepore, Karachi, Mhow, Kampti, Deesa, Saugor, Jhansi, Poona, Meerut, Lucknow, Secunderabad, Mandalay, Maymyo, all in British dominions; and in Italy, German possessions, Greece, Havana, Panama, and United States. Unfortunately, the available descriptions of the work done and the results obtained in most of these localities are so vague that they are of little value. Will you, therefore, allow me to appeal through your columns to all medical men and sanitary officers who have interested themselves in the campaign to send me the necessary details to the address given below? The statements should, of course, give the area and population of the district dealt with (including towns, villages, plantations, factories, mines, railways, and ships); the exact nature of the protective measures; and, if possible, any facts bearing on their results. In using the information I will, of course, always take care to give the name of my informant, unless specially desired not to do so.

I am, Sirs, yours faithfully,

RONALD ROSS,
Professor of Tropical Medicine, the University, Liverpool.

March 18th, 1907.

THE TRUE AIM OF MEDICAL EDUCATION.

To the Editors of THE LANCET.

SIRS,—In his address on the True Aim of Medical Education before the Hunterian Society Dr. Lauriston Shaw most ably and powerfully states the case against examinations, both as tests of true knowledge and as incentives to learning. So completely has he handled his subject that there appears nothing else to be said against our present system and little else in favour of that he advocates. Yet, when one carefully studies what Dr. Shaw has said one hardly feels some of his arguments to be altogether convincing. In the world as at present constituted one has in matters of all kinds to choose between two sets of views each compounded of obvious good

and obvious evil. In the subject under discussion it remains for us to weigh the good and the evil of each separate system, and having done so, before coming to a conclusion, further to see how far in each case the evil can be reduced to the minimum.

Dr. Shaw deserves great credit, we must all admit, in exposing the flaws in the present system of examinations, but personally I cannot see why the system itself should not be reformed so as to make examinations, as far as humanly possibly, true tests of knowledge. There is no reason surely why the subjects of the medical curriculum should offer to an examiner an insuperable difficulty in testing a candidate's real knowledge. Viewing the subjects demanded of the student I should have thought the direct contrary to be the case. With examinations properly conducted I cannot see how they can "exert a demoralising effect upon both parties engaged in teaching"; if that, however, be the case at present, reorganisation should meet the difficulty. Dr. Shaw's arguments seem to me entirely to bear against some of the present details of examinations and not against the system itself. The external system of examination is condemed by Dr. Shaw, but here again his attack is not really on the system but on the defective way it is carried out. For he refers to "the ability to keep one's store of facts on the surface and to pour them out speedily in the presence of a stranger—the power which is essentially created by the crammer, a mixture indeed of memory and cheek." The fault here surely lies with the examiner, possibly with the curriculum, but certainly not with the system. An examiner blessed with ordinary intelligence ought surely to be able to detect superficiality. Most of us, less intellectually endowed, do so every day of our lives. Dr. Shaw's explanation of the growth of the examination system during the last half of the nineteenth century is excellent, so excellent, in fact, that it behoves us to hesitate long before we destroy that system. The Briton, he says, loves fairplay and hates patronage; examinations came into general use to lessen the moral harm of nepotism. Now, before dismissing this objection as out of date, Dr. Shaw will have to convince us that human nature has changed for the better.

Dr. Shaw points out how hospital resident appointments are given by selection and how futile it would be to grant them by competitive examination. True enough; but one must bear in mind that the qualities required in a hospital resident obviously are not merely professional and could not be gauged by an examination test. Professors at universities he instances as not selected by examination, but as these are chosen for special work or special teaching, in which they are eminent, it hardly seems to me that the parallel with the examination of a student holds. The ground-work of the medical sciences, if studied apart altogether from examinations, is vast and requires most of a young man's time. Would it not be a mistake to put the student on to research work before he was properly grounded? Though admittedly the educational effect of the former might be greater in the sense that Matthew Arnold uses the word "education," the product would, I think, tend to be superstructure without a foundation.

I am, Sirs, yours faithfully,

Croydon, March 2nd, 1907. A. PERCY ALLAN.

To the Editors of THE LANCET.

SIRS,—In his address before the Hunterian Society on Feb. 15th, as published in THE LANCET of March 2nd, Dr. Lauriston E. Shaw draws attention to the evils of the present examination system in medical education. With your permission I should like to bring forward one or two points, not new it will be said, which in my opinion must tend to uphold the present evils.

A registrable qualification can be obtained by passing the examinations of any one of 15 universities, three conjoint boards, and two apothecaries' societies, all doubtless claiming advantages of their own. Now, in my humble opinion, the practice of medicine is of the nature of a public service, and therefore so many means of entrance are undesirable, being liable to give rise to too great variation in the standard of qualification and unnecessary distinctions by the public as to relative values of the qualifications to the detriment of some of the holders. Within the ranks of the profession itself the obtaining of many qualifications (of the nature of vain repetitions) is encouraged by the fact that institution appointments in the majority of cases are given to those who can show the largest number of combinations of the letters of the alphabet. These are not necessarily indicative of more than an aptitude for retaining series of assorted facts together with a speculative verbosity regarding theories, whilst power of application of knowledge in a practical manner is wholly wanting. Dr. Shaw mentions the lack of desire for these brilliant stars as house officers on the part of some surgeons who are examiners. The holder of an ordinary qualification, such as the Conjoint diploma, whatever his personal qualities may be, is ineligible for the higher posts in institutions except of very humble order, and may from lack of time or means, after holding a resident appointment, be unable to attempt further examinations. He must therefore go into general practice, and may as well stop there; for if later he should see his way to return to the examination arena and obtain another qualification, having got out of the run he stands a poor chance of a senior post at a hospital.

Although his diploma states that he is licensed to practise medicine, midwifery, and surgery, in actual fact he is limited in scope, for it is useless to take up any part of his work specially, as he can only attain the rank of a clinical assistant and remain a feeder to those of many letters on the full staffs of the hospitals. Should he have boldness and confidence in himself and dare to perform operations on his trusting patients, I have heard the remark, "What right has he to operate? he is not on a hospital."

To remedy the present state of affairs is probably no light undertaking, but much will be done by destroying the many-portal system and replacing it by a single body which alone has power to grant qualifications. Thus the General Medical Council might be developed into a Government department, regulating, as it does now, the education of the students at the recognised schools and allowing the periodical examinations to be conducted by the teachers. At the end of the prescribed course of study, subject to the production of satisfactory school certificates, the students would be examined for qualification by a board of examiners specially appointed by the department. One qualification only should be granted—namely, doctor of medicine, any candidates who had particularly distinguished themselves being M.D. with honours.

Until some such simplification of the method of qualification is adopted students must suffer from over-examination by the rival bodies and members of the profession be injured by inequalities not always just.

I am, Sirs, yours faithfully,

March 16th, 1907. A DESIRER OF REFORM.

THE SACCULAR THEORY OF HERNIA.

To the Editors of THE LANCET.

SIRS,—Mr. R. Hamilton Russell in THE LANCET of March 9th, 1907, p. 683, is right in assuming that "there is at least one sentence in my recent paper with which Dr. Keith will, I know, cordially agree. The saccular theory will fall or prevail as it is false or true." To that sentence at least of his last letter I can give a full and unreserved assent; it was just that truth might prevail that I ventured to point out that the two fundamental assertions on which he had based his saccular theory of hernia were without foundation in fact. These two assertions were (1) that there is a diverticulum of peritoneum within the developing bud of the hind limb, which provides a congenital sac for femoral hernia; and (2) that the processus vaginalis may assume during development irregular and multilocular forms, thus furnishing the sacs of the many irregular varieties of inguinal hernia. Perhaps my manner of nailing these to the "counter" was more vigorous than polite or courteous, yet it seemed to me then, as it seems to me now, that the essential thing was that they should be fixed there firmly until Mr. Russell had proved their "face" value. He does not allude to them in his last letter; I conclude, therefore, he agrees with me as to their non-validity. Another reason for my entering into a public criticism of Mr. Russell's theory was that I think the time has come to protest against a current habit on the part of medical men of assigning to "the congenital" all inexplicable conditions of disease. The saccular theory of hernia is a case in point; because hernial sacs manifest uncommon forms and occupy unusual sites they are assumed to be of congenital origin; it is just as difficult to conceive their manner of formation before birth as after birth. More

often than not we use the word "congenital" to mask our ignorance of the real cause.

In the letters of Mr. Edward Deanesly and Mr. R. W. Murray in THE LANCET of Nov. 24th, 1906, p. 1470, and of Mr. Hamilton Russell in your issue of March 9th, 1907, p. 683, we have, I conclude, a full statement of all the facts on which the saccular theory of hernia is based. Concerning these facts all three writers are unanimous. Briefly stated they are: 1. Complete removal of the hernial sac (with, of course, replacement of its contents) works a cure quite as effectively as removal of the sac with suture of the belly wall. They infer, therefore, that it is the presence of a peritoneal sac, not of a lacuna or weakness in the belly wall, which constitutes the essential condition necessary for the formation of a hernia. The sac is not brought down by the hernia; it must therefore be of congenital origin. 2. That the sac, which is usually regarded as of post-natal origin, is similar in form to that which is *known* to be of prenatal origin; all are therefore of prenatal origin. Further, the shape of the sac is often such that it can only be accounted for by supposing that it is of prenatal origin. On these two grounds is based the saccular theory of hernia. As to the first point: I am quite prepared to believe that the supporters of the saccular theory obtain, as they maintain they do, quite as good results by a complete removal of the sac as those who not only remove the sac but also repair the abdominal wall by operations such as those of Macewen or Basini. But it is not necessary for me to point out that those who merely remove the sac really do much more than remove the sac; by their operation they necessarily set up a reparative inflammatory process along the hernial tract which probably leads to a more effective repair of the belly wall with less destruction of its muscular mechanism than the wiring and suturing employed in more radical operations. It is one thing to admit the success of their method of treatment; it is quite another matter to infer from it that hernial sacs are of prenatal origin. As to the second point: the supporters of the saccular theory, on what grounds I cannot conceive, have concluded that the shape of the hernial sac indicates a prenatal origin. We only know of two diverticula of the peritoneum which are formed before birth—namely, the processus vaginalis and one which frequently occurs at the umbilicus. In no instance have these diverticula been seen of an irregular or of a saccular form; a prenatal diverticulum of the peritoneum in the shape of a hernial sac is unknown; so far as its shape goes, then, it indicates a post-natal development for hernial sacs. Everyone will admit that a hernial sac which is freely continuous with the tunica vaginalis, or one that is connected with the tunica by a patent or fibrous funicular process which is decidedly shorter than the inguinal canal, must be of prenatal origin; but these are the only two forms which can be recognised with certainty as such. So far as I can learn the supporters of the saccular theory have not troubled to seek to distinguish such forms from others.

Having now dealt with the slender evidence they have brought forwards in support of their theory I now proceed to bring forward a few details which have escaped their consideration. Since all hernial sacs are pre-formed, why is it that the inguinal sacs fill so readily in the first few years of life, while the femoral sacs do not fill until puberty is reached? Out of 500 consecutive cases of hernia, Mr. Jonathan Hutchinson, junior, found that the inguinal occurred to the femoral form as 3 to 1; Mr. Murray estimates their ratio as 6 to 1; yet in 360 cases of hernia in children Stiles found only one case of femoral hernia—in a girl, aged eight years; in 1424 cases of hernia in children Bull and Coley found only 35 cases of femoral hernia. On the theory that hernia is the result of a high abdominal pressure acting on a weak part of the abdominal wall, I can explain those figures, but I should very much like to know the explanation offered of them by those who hold that all hernial sacs are of congenital origin.

Mr. Deanesly has asked me the question, Why is it, since we all possess weak points in our belly wall and have our abdominal viscera subjected to a high pressure, that we do not all suffer from hernia? In that Mr. Deanesly is in error. We do not all—most fortunately very few of us do—possess any point in our belly wall that cannot resist a pressure much higher than it ever has to bear, even in the stress of a labourer's life. In return I should like to put a question to Mr. Deanesly, Why is it that 50 per cent. of children under four months of age do not suffer from inguinal hernia? He himself has quoted the result of Sach's observations—namely, that the funicular process was found patent in 59 per cent. of inguinal canals examined in children under four months of age. They have the pre-formed sacs; why do they not have the hernia? Hernia is very common during the first year of life, but is this due to the fact that there is a process of patent peritoneum in the inguinal canal? Is it not rather due to the fact that there is a patency or gap in the resisting structures of the belly wall, which the presence of the open diverticulum necessitates? When he argues that the sac is the cause of hernia he forgets that there cannot be a sac unless there be also an opening in the belly wall for the mouth of that sac.

Mr. Russell has kindly supplied descriptions and illustrations of four cases of femoral hernia for my consideration. One is a particularly remarkable case; its sac was continuous with the peritoneum, yet it was not lined by peritoneum; how that sac was formed and how it became continuous with the abdominal cavity—unless it had been formed out of a "congenital" abscess cavity—I really cannot tell. My difficulty in accepting Mr. Russell's explanation—namely, that all four are of congenital origin—is that (1) we have no evidence in the thousands of bodies that have been dissected that there ever exists an empty congenital diverticulum of the peritoneum in the positions occupied by these sacs; and (2) no embryologist or anatomist has seen a trace of them in embryo or fœtus. But my chief reason for refusing Mr. Russell's explanation is that such sacs can be produced experimentally in the dead body under the influence of agencies and conditions which we know are to be found in the living body. It would occupy too much space and time to detail these experiments now, but at some future time I hope space may be accorded me for the purpose in this journal. Meantime, I would recommend the supporters of the saccular theory to make observations on the following points if they wish to reach the truth about hernia: (1) The degree of intra-abdominal pressure which occurs in lifting heavy weights or in vigorous body movements; (2) the resistance power of the loosely fixed peritoneum in the regions where hernia occurs; (3) the resistance power of the femoral sheath—the sole structure which prevents the formation of a femoral hernia; (4) the functional meaning of the femoral canal.

There is one matter concerning which I would thankfully receive information. Is it true, as Mr. Russell asserts, that there is no relationship between the incidence of hernia and the occupation of those who suffer? I cannot lay my hand on exact data, but I have the impression, given me, I think, by Mr. W. McAdam Eccles, that bakers suffer in an undue proportion, and I believe the condition is also very frequent among labourers in brickfields.

I am, Sirs, yours faithfully,

March 18th, 1907. ARTHUR KEITH.

*** Mr. Hamilton Russell has asked us to say that he feels that he cannot engage on equal terms in a newspaper controversy because of the time which must elapse before his communications can reach us, a point which we are sure those interested in this matter will recognise.—ED. L.

THE LATE PROFESSOR BUDIN'S METHOD OF REARING INFANTS.

To the Editors of THE LANCET.

SIRS,—In your review of my translation of Professor Budin's work, "The Nursling," the following statement is made: "The author excludes from his statistics all infants who have not attended at his clinic for *at least one month*. Would it be uncharitable to suggest that the newly-born infant who can survive a month's ordeal of undiluted sterilised milk might survive anything?"

As systematic supervision throughout infancy was the essence of Professor Budin's method of rearing children his statistics had to exclude all cases of less than a certain minimum duration. One month represented three to five attendances at the clinic, and no reliable conclusions could have been made as to the value of medical supervision if observation over shorter periods had been included. A mother needs to be educated to the fact that the fortnightly weighing and inspection of her healthy infant is worth the trouble it entails on her; the cases eliminated were almost without exception thriving infants whose mothers ceased to attend

after the clinic had lost its novelty. No infant was ever compelled to conform to any dietetic dogma by Professor Budin. He studied the feeding of each new patient as a fresh problem. I can confidently assert that none "were wrecked before the end of thirty days" from exposure to "an ordeal of undiluted sterilised milk," and if your reviewer wishes I shall gladly obtain for him the details of every case which attended Professor Budin's consultations for less than one month.

Thanking you for this opportunity to correct a false impression for which, perhaps, I am somewhat to blame,

I am, Sirs, yours faithfully,

W. J. MALONEY, M.B. Edin.

Brook-street, Grosvenor-square, W., March 12th, 1907.

AN OPEN-AIR SCHOOL.

To the Editors of THE LANCET.

SIRS,—In the article by Mr. C. H. Garland and Dr. T. D. Lister on a National School for Consumptives we are told of the necessity for education in hygiene.[1] The education is to be confined, however, to the working class and to those suffering from tuberculosis. Should not a National School of Hygiene take into consideration a method of living which would prevent the commencement of disease? and is not the well-to-do class equally in need of instruction as to the duty and methods of healthy living? It is with the idea of forwarding such an education that I am erecting in Garden City the building which I am calling an open-air school. It is an attempt to demonstrate the possibility of truly healthy conditions of living, not for invalids but for perfectly healthy persons, the result aimed at being to teach the possibility of preventing the first awakening of the germs of consumption.

This life is not to be (as was suggested in the article) "soft" more than any other life lived in the world. Open-air sleeping, eating, and bathing are to be combined with absolutely normal activities. It is proposed by rational feeding and reasonable intellectual and artistic development to produce a finer type of physique and a higher degree of mental and moral capacity than is at present known. I should gladly welcome any inquiry or any visit, though the building will not be complete for several months.

I am, Sirs, yours faithfully,

March 18th, 1907. A. J. LAWRENCE.

GRADUATED LABOUR IN SANATORIUMS.

To the Editors of THE LANCET.

SIRS,—Your readers may be interested to know that the system of graduated labour advocated by Mr. C. H. Garland and Dr. T. D. Lister in your issue of March 9th for patients in sanatoriums has been in force for two years in this institution with satisfactory results. I have had the pleasure of demonstrating this system both to Mr. Garland and Dr. Lister, and am glad to find they now advocate its general adoption. Again, the suggestion of these gentlemen that patients should be taught to take an intelligent interest in their treatment, and that the cause of the disease and methods of its prevention and arrest should be explained fully to each individual has been adopted here since the institution was opened. We have found, however, that "talks in the recreation room," when combined with close supervision of individual patients and continuous coöperation between doctors and patients, yield far more satisfactory results than any pamphlets or other literature, and in my experience amongst the working classes short individual conversations will do more good in a day than teaching by pamphlet will do in a month.

There is one paragraph in the article which appears to me to be original. I refer to the statement that "it is generally humiliating to a man to perform domestic duties ..... like bed-making, floor-scrubbing, washing-up, and similar duties." An ounce of practice is worth a ton of theory. In our experience here we have never met this feeling of humiliation. Our male patients, when well enough to do so, make their own beds and keep their wards and crockery clean. They do this work cheerfully and well. The men of our navy, army, and mercantile marine, and men in other occupations daily perform such work as "bed-making, floor-scrubbing, and washing-up." Are all these men suffering from a sense of humiliation?

I am, Sirs, yours faithfully,

M. S. PATERSON.

Brompton Hospital Sanatorium, Frimley, March 11th, 1907.

[1] THE LANCET, March 9th, 1907, p. 677.

TREATMENT OF DISTENSION OF THE INTESTINES.

To the Editors of THE LANCET.

SIRS,—The treatment of distension of the intestines, whether following operation or otherwise, is always a matter of difficulty. There has been a considerable amount of correspondence upon the subject in your columns from time to time showing that the question is of importance. My object in writing is to protest against the treatment by puncture. I imagined that such a procedure was relegated to the past and that a student who suggested it at his examination would be sent down for six months. To my surprise I find that this is not so and I have just read in a clinical lecture by a physician at one of the leading London hospitals: "The prognosis of acute gastric dilatation is, however, much better than that of tympanites, for while it is easy to evacuate a distended stomach by the tube it is very difficult to deal mechanically with distension of the intestines. The distended coils of intestine may, it is true, be punctured '*with impunity*' (italics are mine!) by a trocar and cannula, but the escape of gas by the cannula is barely sufficient to give permanent relief."

If this is the teaching which students receive it is not surprising that they should act in accordance with it. That they do is supported by the fact that I was recently called upon to operate on a case of septic peritonitis due to this cause. This, I think, is sufficient evidence to justify me in drawing attention to the subject.

I am, Sirs, yours faithfully,

J. LIONEL STRETTON,
Senior Surgeon, Kidderminster Infirmary and Children's Hospital.

March 15th, 1907.

ON THE CONDITION OF THE BLOOD-VESSELS DURING SHOCK.

To the Editors of THE LANCET.

SIRS,—Though firmly persuaded of the truth of Mark Pattison's saying that "of all the ways of wasting time controversy is the most unprofitable," I feel that I must beg space to reply to Mr. J. D. Malcolm's letter on this subject which appears in your issue of March 16th.

In any sphere of thought it is rare; in medicine it is conspicuously rare, for a theory to be found which will at once embrace all the facts. In the present state of our knowledge we have often to decide between two explanations which are diametrically opposed to one another, and in making our selection between them we have nothing to aid us except the weight of available evidence. Even where the preponderance of that evidence is overwhelmingly on one side, there are not infrequently irritating little facts which, for a time at any rate, decline to be included in the fold. It is facts of this nature upon which, in his tilt against the accepted explanation of the phenomena of shock, Mr. Malcolm has seemed to me unduly to dwell, to the exclusion of those matters of real import upon which the accepted explanation is based. If he wishes to persuade us not only that this explanation is wrong, but that it represents the exact opposite of the true one instead, of insisting upon differences in detail between two observers who are in complete consonance on the main question, Mr. Malcolm ought surely to begin by showing that there are fallacies in the arguments by which the present view is supported. Of these arguments I select one for his demolition. It is possibly not the most cogent of the many which might be adduced; it has, at any rate, the merit of simplicity. It is this. The sphygmanometer shows that the blood pressure in shock is invariably subnormal.[1] The state of the blood pressure depends upon (*a*) the heart, and (*b*) the arteries. Mr. Malcolm has expressed himself satisfied[2] that the heart is not affected in shock. There remain therefore the arteries, including, of course, the arterioles. When these

[1] The Clinical Study of Blood Pressure, T. C. Janeway, 1904, p. 273.
[2] THE LANCET, March 16th, 1907, p. 762.

vessels contract the blood pressure rises, when they dilate the blood pressure falls.[2] The only possible deduction from these elementary facts is that the general state of the blood-vessels in shock is that of dilatation. When Mr. Malcolm has exposed the fallacy in this argument and in others which might be presented in a similar form it will be time enough to consider his excursions into such by-paths as the effects of treatment of which his paper was composed.

Concerning the effects of treatment, it seems pertinent to inquire whether Mr. Malcolm's belief in his view of the constricted state of the blood-vessels in shock has ever induced him to exhibit full doses of nitrite of amyl in that condition. So prompt and reliable a vaso-dilator could hardly fail to produce a very impressive result.

I am, Sirs, yours faithfully,

London, W., March 16th, 1907. LEONARD WILLIAMS.

FIRE AT THE ROYAL FREE HOSPITAL.

To the Editors of THE LANCET.

SIRS,—In order to allay anxiety on the part of friends of patients and others interested in the Royal Free Hospital which may result from the reports published in some of the newspapers respecting a small fire which occurred in one of the wards early on the morning of March 14th, I venture to ask you kindly to grant space for the following statement. The fire was caused by the joists under one of the fireplaces in the "Annie Zunz" Ward having become ignited. Owing, however, to the prompt action of the hospital staff and the fire brigade the fire was very quickly extinguished and none of the patients were seriously alarmed. I am glad to be able to state that the medical staff report that all the patients are entirely free from any ill-effects from what might have proved a very serious calamity. I may state that the hospital is fully equipped with fire-extinguishing appliances and all the porters and nursing staff are regularly drilled and instructed by an expert fireman in the use of the fire appliances.

I am, Sirs, yours faithfully,

C. W. THIES, Secretary.

Royal Free Hospital, London, W.C., March 16th, 1907.

THE POWERS OF MEDICAL OFFICERS OF HEALTH.

To the Editors of THE LANCET.

SIRS,—I take it the reason for the existence of the medical officer of health is that he may assist to the utmost of his power in stamping out, or, at least, scotching the inroad of, infectious diseases. But the medical officer of health has not the legal peremptory power to exercise this necessary function. He has to consider who it is that makes the complaint, whom the complaint is lodged against, and whether it will pay him to take up the case at all. He is not a free agent, with all his knowledge of sanitation; with all his convictions of the existence and dissemination of the death-dealing microbe, he must wait for it to assert itself, and he cannot, in many cases, forestall it by precautionary measures. I know of a case where a medical officer of health was appointed by a town council and the terms of his appointment were such as empowered it to "kick its own nigger." This was the actual expression used. The council did kick its own nigger and kicked him out of his office. There seems to me greatly to need an extension of the Act of Parliament giving to the medical officer of health absolute power of control for the repression to the extent of his ability of notifiable diseases. Of course, he would be still liable for damages in case of malicious interference. The public well-being demands it, even if the mayor or the town clerk kept pigs in a proscribed area.

To bring this closer home by an illustration of fact, I have lately been elected on to the committee of a mechanics' institution of over 4000 members. It is shockingly badly ventilated. I have applied to the medical officer of health. He cannot help me. It is a private institution. I have applied to him for a copy of the list of notified cases to hand over to the librarian to prevent the re-issue of books returned from an infectious case—for what is more natural than that a convalescent should seek readable books? He dare not give it to me. I have written the town clerk to strengthen his hand. He agrees that the consequences might be serious if the medical officer of health did. I have written to the President of the Local Government Board two or three times. We have spotted fever near us and around; we are likely soon to have it. I have at last a letter this morning from the Assistant Secretary stating that the Board has no jurisdiction and cannot undertake to intervene in the matter of ventilation. With reference to the library, the Board is not aware of any statutory provisions requiring the medical officer of health to inform the committee of a library of the cases of infectious disease notified to him as the medical officer of health.

I believe I have heard that medical officers of health are themselves trying to get an increase of powers and a security of tenure of office in this independent direction. This seems to be a case that is recent and important enough to help them. An amendment to their Act seems necessary if anyone will undertake to get a Member of Parliament not to consent to wait until the mare is gone before he locks the stable door. I have myself retired from practice as a dental surgeon, and having no axe to grind shall be happy to place my facts and any assistance I can give at the disposal of anyone in thorough earnest on these matters of public health.

I am, Sirs, yours faithfully,

HENRY BLANDY, L.D.S. Edin., Irel., & Glasg.,
late Dental Surgeon to Nottingham General Hospital, Eye Infirmary, and Lenton and Beeston Orphanages.

146, Gregory Boulevard, Nottingham, March 17th, 1907.

YELLOW FEVER IN CUBA AND ITS MEANS OF PROPAGATION.

To the Editors of THE LANCET.

SIRS,—In reviewing my article on "Yellow Fever again in Cuba" in your editorial comment published in THE LANCET of Feb. 23rd, 1907, you have placed me in a wrong light and consequently made me suffer an injustice which, I am sure, was unintentionally done. The concluding words of your elucidation of my writing are the following: "His article is not without interest but will hardly modify the opinions of those who concluded with the several commissions that yellow fever is propagated by mosquitoes." These words give the wrong impression that I do not believe yellow fever is propagated by mosquitoes, and *there* is where you inadvertently have placed me in a false light. *I have never denied that yellow fever is transmitted by mosquitoes.* What I have always contended from the very first moment it was brought to public notice in Havana is the conclusion of the American Yellow Fever Commission in Cuba in 1900, that "the female mosquito of the species stegomyia fasciata is the only and exclusive etiological cause, and the only and exclusive means of propagation of yellow fever." Which certainly is a very different thing from what you, unconsciously, accuse me of believing. I am of opinion that although mosquitoes, no doubt, transmit yellow fever under certain and well-defined conditions, yet there are besides other means of propagation of yellow fever—as, for instance, biting flies, bed-bugs, lice, chigoes, fleas, sand ticks, and other kinds of ticks. And it is very strange that no controlling experiments had been made with these domestic insects.

Another error in your kind review of my article is that the grand total of 89 cases of yellow fever, with 37 deaths (a death-rate of 41·57 per cent.) does not cover the whole year 1906, but only goes as far as July 1st; that is, to the end of the first six months of that year. During the second semester of 1906 a great many more cases of yellow fever occurred in Cuba.

I am, Sirs, yours faithfully,

A. M. FERNANDEZ DE YBARRA, A.B., M.D.

New York City, March 10th, 1907.

THE ELECTIONS OF GUARDIANS.

To the Editors of THE LANCET.

SIRS,—I think it a pity that Mr. J. Theodore Dodd, a guardian and councillor of the city of Oxford, should attempt to drag the vexed question of out-door relief into the columns of a medical journal. His axiom that infectious diseases, such as measles, whooping-cough, fevers of various descriptions, and phthisis, may be checked by being brought to the notice of a medical man at an early stage goes, of course, without saying, but when he launches out into the general question of "out-relief" I venture to submit that this is a very different

[2] R. H. Starling: Elements of Human Physiology.

matter, and to suggest to the already heavily rated medical man that in view of the terrible abuses of this system which have been brought to light in a recent Local Government Board inquiry he will do well to pause before voting for guardians who are pledged to extend the facilities for this form of relief, thereby further pauperising the recipients and placing an extra burden on his own shoulders.

I am, Sirs, yours faithfully,

E. G. YOUNGER, M.D.Brux., M.R.C.P. Lond., D.P.H.

Mecklenburgh-square, W.C., March 18th, 1907.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

The General Hospital.

THE annual report of the board of management of the General Hospital shows a very satisfactory condition of affairs. The total expenditure for the year was £25,849 and the total income was £27,435, the latter being a little more than £1000 greater than the income of the previous year. On the other hand, it must be noted that the income derived from subscriptions, extra tickets, ordinary donations, and special congregational collections showed a slight, though distinct, falling off. During the year the daily average of in-patients was 304, the total number being 5204, and the cost per patient was £3 6*s.* 10*d.* Amongst the in-patients were included 1155 children under 12 years of age and of these 185 were less than two years old. The out-patients numbered 65,427, and each cost, exclusive of teeth extractions, 2*s.* The number of operations continues to increase; last year 3344 were performed, and as many are of a serious character they form a constantly increasing source of expense. The number of the out-patients is becoming so great that it constitutes a severe strain on the staff. Many of the cases are of quite a simple character, but their examination and treatment take time which might with advantage be devoted to more serious cases. This fact has been recognised for some time and steps are being taken to form a plan for the treatment of the more simple cases as dispensary or club patients. In the last annual report attention was drawn to a new plan for dealing with cases waiting for admission and the success of this is now recorded; it has worked so well that it is only at times of great pressure that any case has to wait a month before admission. It is stated in the report that many expressions of gratitude are received from patients and their friends but only a small minority of these are accompanied by contributions to the funds of the hospital.

The Walsall and District Hospital.

Considerable advances have been made at the hospital during the past year. Two additional wards have been built, and an additional operating theatre, a surgery for casualty cases, a new steam laundry, a disinfecting chamber, a new dispensary, and a more commodious x-ray room have been provided. The income for the year exceeded the expenditure by £43, but it will have to be considerably increased next year if it is to cover the increased expenditure which will be necessary for the proper upkeep of the new departments, and the executive committee is wise in appealing at once for increased support.

The Care of the Feeble-minded.

At the annual meeting of the supporters of the Laundry and Homes of Industry, which attempt, amongst other things, to deal in a practical manner with the care of feeble-minded young women, Mrs. Hume Pinsent made an eloquent and forcible appeal for State interference. She pointed out that their society had proved that feeble-minded girls could be made useful and happy, but it was only possible to deal with a limited number. For this there were two reasons—want of means and absence of any power of legal restraint. Mrs. Pinsent emphasised the fact that the money extracted from ratepayers for the education of mentally defective children is practically thrown away, for when the school period is over there is practically no safe place to which the girls can go, and none to which they can be made to go, the result being that both they and their children have eventually to be kept at the public expense. Voluntary subscriptions have hitherto proved utterly inadequate to meet the necessities and with the regularly increasing burden of rates and taxes out of all proportion to the general increase of incomes, it is not likely that voluntary subscriptions will increase to any great extent. It is perhaps not to be wished that they should, for if there is any chance of staving off the consideration of a difficult subject Governments are not likely to interfere where no votes are to be gained, and it is important that this should become a prominent question, for the feeble-minded and the insane are two great dangers which threaten the best interests of the State, and at present no adequate provision is made for dealing properly with either the one or the other, while both might be practically eradicated in a comparatively short time if they were dealt with in a firm and efficient manner.

Measles and Diphtheria.

We are suffering at present from a very definite epidemic of measles and it has been found necessary to close many schools. During the past week there were 19 deaths from this disease, and there do not seem to be any signs of diminution. Diphtheria also continues to be very prevalent but fortunately it is still of a very mild type. Scarlet fever has diminished but typhoid fever shows signs of increased activity.

March 19th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

Ladies Charity and Lying-in Hospital.

THE annual meeting of the supporters of this charity was held last week at the town hall under the presidency of the Lord Mayor. The board of management reported that, owing to the improved condition of the working classes of the city, the number of patients attended to in the outdoor department was only 1645, as against 1847 in the previous year. The number of in-patients was 295, as against 322 in the year 1905. In the school of midwifery 57 pupils were trained during the year; these attended the examination of the Central Midwives Board in accordance with the new Act, of whom 54 qualified. Professor A. M. Paterson, in moving a vote of thanks to the board of management and the medical staff, emphasised the fact that the charity was doing a great work, not merely for the relief of the poor but also in an educational sense, and this had been brought about through the harmonious feeling that existed between the charity and the University of Liverpool. Mr. J. B. Fortune had provided an operating table for the hospital. Lady Hampson had raised among her friends £564 to provide necessaries for the patients without trenching on the honorary treasurer's funds. The out-door department is now fully utilised by the medical students at the University for the purposes of practical midwifery under the supervision of Professor Henry Briggs.

The Proposed New Dental Hospital.

The committee of the Liverpool Dental Hospital has decided to make a public appeal for the erection of a new hospital. The present building—which is a converted dwelling-house in Mount Pleasant and has been used as a hospital for nearly 30 years—is now totally inadequate for the needs of the charity. It has been altered and enlarged from time to time until now all the available space is occupied. In every respect the accommodation is insufficient. The space available for operating-rooms and laboratories is far too limited. The sanitary condition of the hospital is also unsatisfactory. This hospital is the only dental hospital in Liverpool and is largely used by the poor of the city. During the year 1906, 23,982 patients were treated. Over 30,000 operations were performed and of these about 11,000 were operations not for the extraction but for the preservation of the teeth. With more adequate appliances and accommodation the number of operations in this category would be greatly increased. The Dental Hospital is affiliated to the University of Liverpool through the school of dental surgery, the dean of which has a seat at the medical faculty. By this means two important ends are gained. Without the assistance of the students the greater portion of the work accomplished could not be undertaken by the staff of the hospital, and without the practice of the hospital the school of dental surgery could not exist. It is estimated that the cost of a new hospital will be about £10,000, including equipment. Promises of support already received amount to over £5676.

towards which the hospital staff and school fund have contributed £1000.

The Liverpool Stanley Hospital.

The annual meeting of the subscribers to the Liverpool Stanley Hospital was held at the town hall on March 9th, under the chairmanship of the Lord Mayor. One of the features of the report was the recent creation of a gynæcological department, to which Miss M. H. F. Ivens, M.B., M.S. Lond., was appointed the gynæcologist. A special ward to contain six beds was being built in connexion with this department, but the committee had decided that the total number of beds in use at the hospital should not be increased till the existing debt was removed. The cost of the new ward had been defrayed by, and was dedicated to the memory of, Mrs. J. H. Thom. It was the wish of the donor that the post should be filled by a lady practitioner.

Cerebro-spinal Meningitis and Notification.

At a meeting of the city council held on March 6th, the following motion was carried:—

That the council, as the urban sanitary authority of the city of Liverpool, do order that the provisions of the Infectious Disease (Notification) Act, 1889, shall apply in their district for six months to cerebro-spinal meningitis, and that such order shall come into operation immediately after the expiration of one week after the publication of first advertisement of the order as approved by the Local Government Board.

Notice has been given that the above order was approved by the Local Government Board on March 12th, 1907.

Sir Rubert Boyce's Illness.

Professor Sir Rubert Boyce has written to the chairman of the Liverpool School of Tropical Medicine (Sir Alfred Jones) under date of Feb. 27th from Grand Canary, saying that his health is daily improving.

The University of Liverpool and Physical Anthropology.

It is proposed to establish a lectureship in physical anthropology at the University. With the material available in the University and in the city museum the establishment of such a lectureship would do much to stimulate interest in the subject in its many branches.

March 19th.

WALES AND WESTERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENTS.)

Infantile Mortality in Cardiff.

AT a meeting of the Cardiff corporation held in December, 1906, some members appear to have been unduly alarmed at what they described as the high rate of infant mortality in Cardiff during the third quarter of the year, and Dr. E. Walford, the medical officer of health, was instructed to inquire more fully into the causes of this high rate. In the special report on the subject, which has recently been issued by Dr. Walford, he points out that although the infantile mortality-rate in Cardiff during the third quarter of 1906 was 154 per 1000 births it must be kept in mind that the rate in the 76 large towns during the same period was 209 per 1000 and that for the whole of the year the Cardiff rate was only 134 per 1000. He points out that one third of the total number of deaths of young children was due to diarrhœal diseases and the recommendations which he makes are chiefly concerned with lessening the incidence of these diseases. He very prudently refuses to attribute the presence of diarrhœa among children to one specific cause, the removal of which will remove the disease. While admitting that a most important direct cause is improper feeding, he refers to the fact that the highest rate of infantile mortality occurs in the central districts of the town in which the density of the population is the highest and in which the housing accommodation and general sanitation compare unfavourably with the newer districts, where the streets and buildings have been laid out in accordance with modern ideas. He also lays stress upon the importance of the special cleansing of streets and the flushing of street gullies in hot weather, as well as on the importance of reducing the amount of dust caused by tramcars, motor-cars, and other vehicles. Among his specific recommendations are the appointment of additional women inspectors (there is at present only one in Cardiff), the control and supervision of milk supplied to infants artificially fed, and the provision of more complete statutory control over the milk-supply.

Cardiff Infirmary.

The committee of management of the Cardiff Infirmary has issued a strong appeal for £30,000 to be employed in making several much-needed additions to the institution. It is proposed to erect a new pavilion to contain 64 beds, a new gynæcological operating-room, a clinical laboratory, a museum, and a new post-mortem room.

Public Health in Aberystwyth.

Dr. Abraham Thomas in his annual report to the town council of Aberystwyth stated that the number of births was 172, compared with an average of 173 for the decade, and that there were 143 deaths, compared with an average of 140 for the decade. Infantile mortality was equivalent to the very high rate of 188 deaths per 1000 births registered. It was remarkable that in a health resort like Aberystwyth, with all its natural and hygienic advantages, the infant mortality should be higher than in the large industrial centres of England. Proper care and attention to the feeding of infants would result in a large saving of infant life and rapidly lower the death-rate. The total number of deaths from zymotic diseases at Aberystwyth during the past ten years was 92, which was equivalent to an annual zymotic death-rate of 1·14 per 1000. Some of the infectious diseases were imported by visitors and the absence of an isolation hospital entailed loss and hardship on lodging-house keepers. In the interests of the town as a watering-place and educational centre the provision of hospital accommodation for infectious cases was absolutely imperative. The drainage system was satisfactory and the quality of the water-supply was above suspicion. The meteorological records showed the remarkable evenness of temperature which prevailed at Aberystwyth and practically extended throughout the whole year, so much so that the winter temperature approaches that of the south coast health resorts. The climate, despite its mildness, was bracing and suitable for convalescents to recruit their health and strength.

The Adulteration of Cider.

The increased consumption of cider outside the counties in which the cider apples are grown is no doubt responsible to a great extent for the amount of adulteration which this beverage is said to undergo. During the past two years the National Fruit and Cider Institute has been making investigations as to the purity of the cider which is being sold. As a result it has been found that salicylic acid is being widely used as a preservative, while in some samples of cider no apple juice has been present at all. Although cider is commonly supposed to be pure apple juice it appears that difficulties have arisen in preventing the addition of other substances through the absence of any precise definition. A representation has recently been made by cider makers in the western counties to the President of the Local Government Board and the President of the Board of Agriculture and Fisheries asking that pure cider should be defined and that steps should be taken to prevent its adulteration.

Reform of the Poor Laws.

In making suggestions to the Poor-law Commission for the reform of the Poor laws the Bristol board of guardians has very properly distinguished between habitual vagrants and *bonâ-fide* workmen in search of work. In the opinion of the board the former should be detained in State labour colonies long enough to secure some reformation of character, while the latter only should be lodged in the workhouses and passed on with way tickets entitling them to food and lodging in neighbouring workhouses. A further suggestion of the Bristol board is that the provision made for the destitute should be restricted to necessaries and should be less agreeable than the lot of the self-maintaining labourer, although the sick, the imbeciles, and the children, who are not responsible for their position, should be well cared for.

Sanitary Matters in the Tavistock Rural District.

At the meeting of the Tavistock (Devon) rural district council held on March 15th a letter was read from the Local Government Board stating that it cannot regard as satisfactory the reply of the council to the report of Dr. R. Deane Sweeting. The Board specifies several urgently needed sanitary improvements mentioned in Dr. Sweeting's report and asks what steps the council is taking to carry Dr. Sweeting's recommendations into effect. The Local Government Board adds that after a full consideration of Mr. C. C. Brodrick's reply to the criticisms on the performance of his duties as medical officer of health the Board cannot regard

it as satisfactory, and Mr. Brodrick's reappointment as medical officer of health is only sanctioned until April 30th, 1907. After considering the communication the council decided to refer the matter to a committee.

The Devon County Council and the Midwives Act.

At a meeting of the Devon county council held on March 14th Sir John Shelley moved the adoption of the recommendation of the general purposes committee:—

That the delegation of the powers under the Midwives Act, 1902, to district councils be revoked, the delegation to the committee, however, not to be affected, and that arrangements be made for the supervision and inspection of midwives by Poor-law medical officers throughout the county at certain fees.

After some discussion the county council decided to revoke the delegation to the district councils and the second recommendation was deleted on the understanding that the committee will reconsider the matter with the view to recommending that the inspection of midwives be undertaken by the medical officers of health instead of by Poor-law medical officers.

Chester Infirmary.

On March 13th a public meeting was held in Chester town-hall to consider the proposal of making a public presentation to Mr. James Taylor who is retiring after 40 years' service as surgeon to the Chester Infirmary. Mr. Robert B. Wright, president of the Chester Medical Society, proposed the following motion:—

That Mr. James Taylor's 40 years' service to the public as surgeon to the Chester Infirmary, his high professional attainments, and the estimation in which he is held call for public recognition.

This was seconded by Mr. Bridge and carried unanimously. Mr. B. C. Roberts proposed that a subscription list should be at once opened and that all the Chester banks should be asked to receive contributions. This was seconded by Dr. John Roberts and agreed to. On the motion of Dr. Henry Stolterfoth a committee was appointed to carry out the preceding resolutions, Dr. Roberts being the treasurer and Dr. A. G. Hamilton the secretary.

March 18th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Edinburgh Royal Infirmary.

THIS important institution is so greatly in need of money that the directors have issued a special appeal to the inhabitants of Edinburgh. It is pointed out that the hospital is the largest general hospital in the kingdom, having 900 beds available for daily use. The total cost of upkeep amounts to between £52,000 and £53,000 annually. Of this amount only between £17,000 and £18,000 are received from living contributors and less than one-half of this amount is received from Edinburgh. With interest on accumulated capital and students' fees the sum is made up to over £33 000 per annum, the deficiency having to be made up from capital. It is shown that there has been no increase in the subscriptions from Edinburgh, but the reverse; some years ago the district contributed about £2 for each patient sent to the hospital from the district, now only £1 9s. is subscribed. In 1906 the cost of patients from the district amounted to £30,364 and the city and district only contributed £8839 towards this sum. It is to be hoped that this appeal will be liberally responded to.

Edinburgh Royal Hospital for Sick Children.

The annual report of this hospital has been issued and shows that during the year 2215 children were treated in the wards, as compared with 1952 during the previous year. Of the total number 479 were infants under one year. In the out-patient department there had been 27,046 patients, as compared with 26,966 in the preceding year. The annual income, apart from legacies, had been £5511, a falling off of £553 as compared with 1905. The need of a convalescent home in connexion with the hospital is referred to, but the want of money prevents the directors from carrying out their scheme for its establishment.

Fire at Larbert Sanatorium.

On Monday an alarming fire, which might have been very disastrous to life considering the class of patients, occurred at the sanatorium of the Scottish National Imbecile Institution, Larbert. The sanatorium was erected about two years ago at a cost of something like £3000 and stands apart from the main structure of the institution. The fire apparently originated in the nurses' quarters and for a considerable time raged very fiercely and threatened the other buildings owing to the high wind which prevailed. The patients in the sanatorium numbered 22, and were mainly imbecile children suffering from tuberculous disease. Fortunately they were all able to be removed without injury or loss of life. The damage, estimated at £2000, is principally in the central part of the sanatorium which is entirely gutted and unroofed.

Treatment of Inebriates.

In connexion with the closing of the Girgenti Home for Inebriates, mentioned in THE LANCET of last week, it is interesting to compare the results obtained at Invernith Lodge Retreat where the work is carried on amongst a better class of patients. The report of this institution for 1906 has just been issued. During that time 77 patients entered for treatment; of these 64 were for inebriety in alcohol and 13 for narcomania. Since May 1st, 1901, when the institution was first started, 292 patients have been treated. It has been possible to trace 209 of these cases and thus taking into account 35 still under treatment and two who died whilst in residence, only 52 are left of whom it is impossible to state the final result of treatment. 63 patients have been cured—that is to say, they have been away from the institution for over a year and are and have been free from their habit, whilst 32, who have not been away for a year, are now free from their habit and are thus hopeful cases. These combined cases are 95 in number and when there are deducted those not traced, those under treatment, and those who died in residence, give a percentage of 46·7. Considering the difficulty of the work this percentage seems very gratifying.

March 19th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Viceregal Commission on the Poor-law in Ireland.

SOME of the recommendations of the Viceregal Commission, especially those which would remove influence from the local boards of guardians, were discussed and objected to by the South Dublin union board some months ago. The Royal Academy of Medicine in Ireland passed recently the following proposition:—

That the Royal Academy of Medicine in Ireland desires to express its approval of the suggestion contained in the report of the Viceregal Poor-Law Commission to convert the entire Poor-Law Medical Service in Ireland into a national service, to be paid by the State, to be entered by a competitive examination, the members of such service to be jointly controlled by the central body and the local bodies, and that the medical profession should have representation on the central body.

Women's National Health Association for Ireland.

A meeting of ladies and gentlemen took place at the Royal College of Physicians on March 13th under the presidency of the Lord Lieutenant. It was resolved that a Women's National Health Association should be formed for Ireland, and the speakers in favour of the establishment of such an organisation included the Registrar-General, the Bishop of Cashel, Sir Charles A. Cameron, the Moderator of the General Assembly, the Dean of St. Patrick's, the Dowager Marchioness of Dufferin, and others. There was a very large attendance.

The Health Commission in Belfast.

The Commission has spent the week since my last letter in a personal visitation of the slums of the city, the various insanitary areas, and places where certain industries are carried on. The Commissioners are holding no morning sittings but propose to hold two evening meetings, which is a most sensible decision, as the working people will thus have an opportunity of giving evidence upon the conditions of labour, the housing of the lower classes, and similar matters of the first interest.

Insanitary Courts in Belfast.

At an inquest held in Belfast on March 12th in reference to the death of an infant, four months old, in Longford-court, was not seen by any medical man, it came out in evidence that in the same place the mother had lost another child who suffered from the same symptoms. After

this occurrence the house was fumigated by the health authorities. The police sergeant said that the yard of the house in which this family lived was in a perfectly filthy state and the place generally was unfit for human habitation, adding that it had been closed some time ago, but had since been reopened. The coroner said that the place appeared to be greatly overcrowded and recommended the jury to advise the sanitary authorities to look into the matter. He ascribed the high death-rate of the city of Belfast to poverty more than anything else.

Lisburn Water-supply.

At the monthly meeting of the Lisburn rural council it was reported by the council's analyst that the water taken from the Killullagh river was dangerous and quite unfit for cattle. It appears that this condition is due to the washings of the filter beds of the Stoneford water area being discharged into the river in an unpurified condition. The council threatens to institute legal proceedings against the Belfast Water Commissioners unless they abate the nuisance.

Queen Alexandra Sanatorium at Davos.

On March 15th, in the City Hall, Belfast, the Lord Mayor (Lord Shaftesbury) presiding, Lord Balfour of Burleigh brought the claims of the new sanatorium at Davos before a large Belfast audience and asked for support. Professor J. A. Lindsay having referred to the climate, other speakers followed and a considerable sum of money was promised for this deserving object.

Queen's College, Belfast.

The fifth annual dinner of past and present students of Queen's College, Belfast, was held on the eve of St. Patrick's Day, March 16th, in the examination hall of the College, Sir John W. Byers presiding, when there was a very large attendance of professors, graduates, and students. Sir John Byers gave some interesting reminiscences of the College, contrasting its present condition with what it was when he first entered as an arts student. He referred to some of his fellow-students who had shed lustre on the College, such as Dr. Joseph Larmor, Lucasian Professor of Mathematics at Cambridge; Dr. Leslie Porter, Commissioner in the Lucknow United Provinces; and Sir John N. Jordan, K.C.M.G., Minister at Pekin. Other speakers were Dr. J. W. Browne, the President of Queen's College, Professor W. St. Clair Symmers, Professor Johnson Symington, Professor G. Wilson, Professor J. A. Lindsay, and Sir Otto Jaffe. The dinner, which was well attended, was a great success.

The Belfast Ophthalmic Institution.

At the annual meeting of the supporters of this hospital held on March 18th the report submitted showed that 1492 extern eye and 754 ear, nose, and throat patients were treated during the year and 174 cases were received into the wards. The improvement and refitting of the extern department are urged by the staff at an expense of about £250, and of this Dr. J. Walton Browne (senior surgeon) announced that a friend had promised £50. Financially, the amount due to the bank has been reduced to a little over £100, and as to yearly expenditure there was a shortage of £60 3*s.* 11*d.* Several speakers referred to the admirable work done at the hospital.

Cerebro-spinal Fever.

Up to to-day (March 19th) 186 cases have been notified with 105 deaths.

Ulster Hospital for Women and Children.

At the annual meeting of the supporters of this hospital held on March 11th it was reported that there had been of intern patients 247 children and 81 women. There had been in the out-patient department 2584 children (of whom 637 were eye cases) and 609 women. There were six intern and 260 extern maternity cases. The rebuilding of the hospital was urged. The only change in the medical staff is that Mr. H. H. B. Cunningham replaces Dr. C. E. Shaw as ophthalmic surgeon. Financially, the total income for the past year was £1217 9*s.* 6*d.* and the expenditure was £1163 9*s.* 9*d.*, leaving a balance in hand of £84 3*s.* 4*d.* Mr. G. W. Wolff, M.P., has promised £1000 on condition that all the money (£10,000) is secured for erecting the new hospital before commencing work.

March 19th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Radiotherapy and Spasmodic Spinal Paralyses.

M. Babinski recently published an account of a case in which he had obtained a successful result from radiotherapy. The case was that of a child, aged 15 years, who, after a motor-car accident, suffered from general spastic contractions of the neck, the trunk, and all four limbs. A spinal hæmorrhage or pachymeningitis was suspected. At the meeting of the Hospital Medical Society, held on March 1st, M. Babinski brought forward a somewhat similar case. The patient, a woman, aged 24 years, suffered from contractions of the legs, with paralysis and involuntary spastic movements. The tendon reflexes were exaggerated, there was spinal epilepsy, and the great toe sign was obtainable. 12 sittings for radiotherapy brought about considerable improvement. Except in the cases of Pott's disease or of syphilitic spinal paralysis no other kind of spasmodic paralysis has run a similar course. M. Babinski considered that the woman had either a patch of spinal sclerosis or else a sarcoma compressing the spinal cord.

Stripping off the Pulmonary Pleura.

On March 5th M. Delorme read before the Academy of Medicine a paper dealing with the case of a patient, under the care of M. Picqué, who had an empyema due to a knife stab. For this he was operated upon three times but the wound did not heal. M. Picqué thereupon cut down on to the contracted lung and stripped off the thickened and inelastic pleura which prevented expansion of the lung, with the result that very soon the patient was perfectly well. M. Delorme discussed the indications for this procedure which he was the first to advocate. Stripping off the pleura should be employed only in cases of diffuse empyema where the two surfaces, visceral and thoracic, of the pleura are separated to an extent of at least six centimetres. Moreover, the operation should not be done unless respiratory gymnastics, begun a few days after the operation for empyema, have failed to make the lung expand. Empyemata starting from simple outside infection seem to give better results than those which are consecutive to pleuro-pulmonary infections.

The Radiotherapy of Chronic and Gonorrhœal Rheumatism.

M. Dominici and M. Gy have been making researches into this subject and the results thereof were presented to the Academy of Medicine on March 5th in a paper read by M. Albert Robin. M. Dominici and M. Gy made use of metal screens or squares of cloth to which the radio-active substances were fixed by means of varnish. They came to the conclusion that radium exercises a remarkable influence for good in either form of rheumatism treated. The œdema, the pain, and the reflex contractions all disappeared. The joints rapidly regained their proper functions and as a consequence the muscular dystrophy gradually disappeared also.

The Antitoxic Rôle played by Calcium Chloride in Bright's Disease.

At the meeting of the Biological Society held on Feb. 23rd M. Iscovesco read a paper on the above subject. He stated that he had found that patients suffering from Bright's disease of the non-polyuric form but who passed from three to 15 grammes of albumin per litre showed a very considerably diminished globular resistance and their serum was very hæmolytic. If, however, calcium salts were added to the serum of these patients the hæmolytic power was diminished or even suppressed altogether. He therefore gave a number of patients coming into the above category chloride of calcium by the mouth in doses of from 20 to 75 centigrammes per diem. In all the cases the amount of albumin excreted was diminished; in one case at the end of a month it had fallen from 8 grammes per litre to 1·50 grammes. In another the amount fell from 12 grammes per litre to 1·50 grammes. The general condition of the patients also improved and the hæmolytic power of the serum diminished. M. Iscovesco could not find any case in which the albuminuria disappeared altogether. In his opinion albuminuria depends upon two factors, the one renal, on which calcium chloride exerts no influence, and the other has to do with the blood. It is upon this last that calcium chloride acts so well. Milk has long been recommended as a

most suitable food for albuminurics and it may be that its suitability is due to the calcium salts which it contains.

Le Certificat d'Études Médicales Supérieures.

In THE LANCET of Nov. 24th, 1906, p. 1477, I gave your readers some account of the various protests made by the French medical profession against the decree creating the *certificat d'études médicales supérieures* which dated from July 25th, 1906. The great objection was to the title which it was thought would make the public believe, though wrongly, that the holders of this certificate possessed superior medical knowledge to that of those who did not possess it. The opponents of the decree have now gained the day, for the President of the Republic has just issued another decree making the certificate in question null and void. The Minister of Public Instruction has, for his part, appointed an extra-Parliamentary Commission of 73 members to inquire into the question of what modification can be imported into the organisation of medical studies as at present existing.

March 18th.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

New University Buildings in Zürich.

VERY important enlargements of the premises occupied by the University of Zürich and its scientific and clinical annexes are being planned at a cost of about £300,000. The first series of buildings proposed by a scientific committee headed by the professor of zoology, Mr. Lang, will be commenced as soon as the necessary credit has been granted by public vote to the cantonal and town authorities. This series consists of a new university building which is to occupy a prominent position near the Federal Polytechnic School; it will be an imposing structure and is to cost £150,000. Next to it the Zoological Institute is to be erected at a cost of £57,000 and last, but not least, a new building for hygiene and bacteriology costing £26,000. There is some anxiety in university circles as to whether the inhabitants of the canton of Zürich, already burdened by heavy direct taxation, will grant these considerable sums of money, because later a further grant of some £60,000 will be required for new isolation wards and for the enlargement of the surgical wards and the Institute for Physical Therapeutics. The inhabitants of Zürich regard with no very favourable eye the increase of foreign students, especially Russians, which increase is partly responsible for these new structures. The University of Zürich has at present 1339 regular students and 336 "Auditoren" who only attend a few lectures. Of the 1339 regular students only 576 are Swiss, the remaining 763, who, of course, form the majority, being foreigners. The Russian students are quite to the front, with 455 male and female students, just numbering one-third of all the students. The question is being raised whether this number should not be reduced by new legislative steps.

Therapeutics of Scarlet Fever.

At a meeting of the Society of Zürich Practitioners, held on March 7th, Dr. Theodore Zangger read a paper on the Pathology and Therapeutics of Scarlet Fever. He gave some interesting details about the mortality of this disease in Zürich. In the years 1904 and 1905 the endemic prevalence of scarlet fever, from which some 300 patients suffer every year (the population of Zürich is 170,000), took an epidemic form, 1321 and 1468 cases being announced to the sanitary authorities. No doubt several hundred cases in these years escaped notification through being treated at home without medical aid or by quacks. The majority of cases were treated at the Cantonal Hospital under Professor Eichhorst. In 1904 there were 15 deaths and in 1905 there were 23 deaths. For 2789 cases this gives a mortality of scarcely 1·5 per cent., a very low average when compared with other statistics. Dr. Zangger proposed more active treatment for all cases of scarlet fever in the form of a spray of a 2 or 3 per cent. solution of peroxide of hydrogen applied to the nostrils and throat twice a day so long as abnormal secretion and inflammation continued. Wet packs and baths also form part of this treatment which gave good results as regards complications.

March 11th.

Obituary.

ARTHUR ERNEST SANSOM, M.D. LOND., F.R.C.P. LOND.,

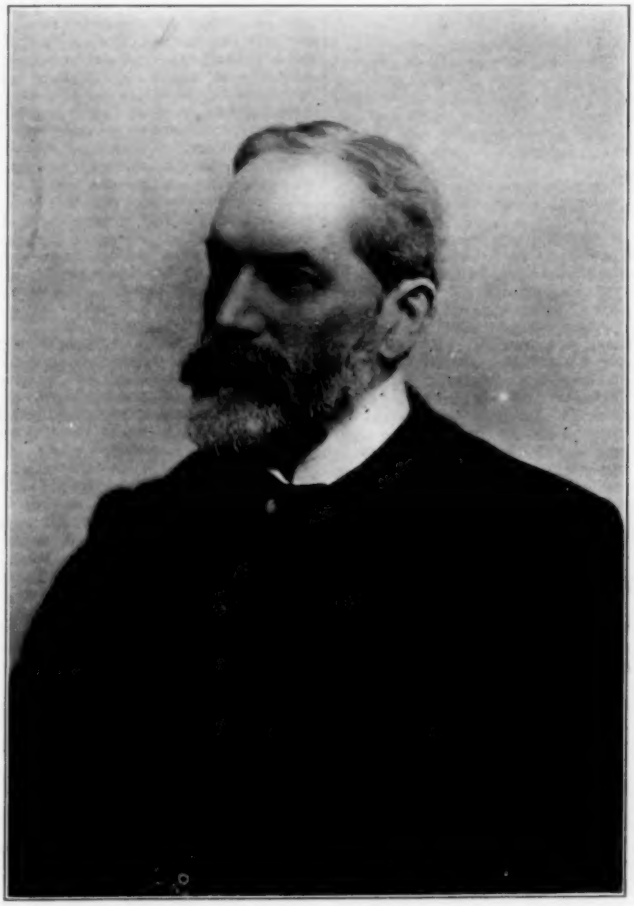
CONSULTING PHYSICIAN TO THE LONDON HOSPITAL.

THE announcement of the death of Dr. A. E. Sansom will be received by his many friends with very deep regret. He had been in failing health for some years and retired from active practice about two and a half years before his death, residing first at Hampstead and subsequently at Bournemouth, where he died on March 10th.

Arthur Ernest Sansom was born at Corsham, Wiltshire, on May 13th, 1838. His father was a gentleman farmer; his mother a lineal descendant of the celebrated divine, Dr. Isaac Barrow. He was educated at Queenwood College, Stockbridge, Hants, where he had the advantage of studying under Professor Tyndall. On leaving school he was under the care of a private tutor at Chippenham in order to prepare for the University of London. He entered King's College, London, at the age of 16 years, at which institution he became Warneford scholar, in addition to gaining many other prizes and successes. He afterwards acted as clinical clerk to the late Dr. Todd. After filling the usual out-patient and in-patient appointments, and being then too young to obtain his diplomas, he proceeded to Paris in order to study at the Hôpital St. Louis, and was a devoted disciple of Poirry. He became a Fellow of King's College. He took the diplomas of M.R.C.S. Eng. and L.S.A. in 1859. In the same year he obtained the degree of Bachelor of Medicine of the University of London and that of Doctor of Medicine in 1866. He was elected a Fellow of the Royal College of Physicians of London in 1878.

Dr. Sansom held the post of assistant physician and subsequently that of physician to the London Hospital and to the North-Eastern Hospital for Children and at the time of his death he was consulting physician to both these institutions. He had also held the appointment of physician to the Royal Albert Orphan Asylum and physician to the Royal Hospital for Diseases of the Chest, City-road. His earlier works were: Chloroform: its Action and Administration, published in 1865; and Anæsthetics in Obstetric Practice, published in 1869, in which he advocated the more general use of a mixture of chloroform and of absolute alcohol. He was the first member of the medical profession in this country to bring before his colleagues the important deductions from Pasteur's researches in fermentation, but his papers read before the Medical Society of London were not received with the favour which they deserved and their embodiment in book form entitled "The Antiseptic System" met with no encouragement. His insight into a subject which was in the future to cause a revolution in surgical practice was, however, remarkable, and the correctness of his views was subsequently confirmed by the researches of Mr. (now Lord) Lister. His best known work was entitled "The Diagnosis of Diseases of the Heart and Thoracic Aorta," published in 1892, and is recognised as one of the standard works on the subject. His valuable researches and observations on diseases of the heart were further recorded in the Lettsomian lectures on the Treatment of Some of the Forms of Valvular Disease of the Heart and also in his articles in Keating's Cyclopædia of Diseases of Children, Quain's "Dictionary of Medicine," the "Twentieth Century of Practice of Medicine," and Allbutt's "System of Medicine." These publications proved him to be one of the leading authorities on diseases of the heart.

In all his writings Dr. Sansom's earnest desire was to inculcate precision—precision of observation and precision of record. He was accustomed to lay particular stress on practical points in diagnosis and treatment. He took infinite pains to procure accurate records of tracings obtained by the sphygmograph and cardiograph. His published works afford ample proof of his labours in this direction. Another feature of his book on "The Diagnosis of Diseases of the Heart" is the numerous reproductions of outlines of the heart and positions of the physical signs as obtained from superficial tracings taken from the actual chest wall in cases of heart disease. His former house physicians or those students who accompanied him in his visits to the wards of the London Hospital will remember the enthusiasm and perseverance with which he obtained such tracings and the pains which he took to explain to those around him the significance and importance which



ARTHUR ERNEST SANSOM, M.D. LOND., F.R.C.P. LOND.,
CONSULTING PHYSICIAN TO THE LONDON HOSPITAL.

be attached to them. Dr. Sansom was a keen supporter of the various medical societies. He was constant in his attendance at many of them and frequently took part in the discussions. He was a past President of the Medical Society. He was also a corresponding member of several foreign societies.

Dr. Sansom was possessed of a most charming personality. His kindness and geniality made him beloved by all who knew him. No one can forget the warmth of his greeting and his true friendliness towards those who were privileged to have a close acquaintance with him. He was a staunch Churchman and in a quiet unostentatious manner performed countless acts of charity and was willing to lend a helping hand to those who required assistance by money, time, and advice. When he retired from practice he caused a gap which was difficult to fill and he left Harley-street amidst the sincere sympathy and regret of his numerous friends. Dr. Sansom was an ardent Freemason and his services to the craft obtained for him the well-deserved honour of Senior Grand Deacon in the Grand Lodge of England in 1902. He took a deep interest in many charitable institutions, especially in the work connected with Epsom College. Dr. Sansom married Miss Weaver, daughter of Mr. Henry Weaver, of Devizes, county surveyor of Wiltshire, who survives him. He leaves six children, his eldest son and his son-in-law being members of the medical profession and his second son practising as a dentist.

The funeral took place on March 14th. The first part of the service was conducted at St. Luke's Church, Hampstead, and many old friends attended to attest their sorrow for the loss of one so largely beloved and respected. The interment followed at Finchley Cemetery.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Clemente J. dos Santos Pinto, professor of operative medicine in the Oporto School of Medicine.—Dr. Paul Krabler, extraordinary professor of children's diseases and of internal medicine in the University of Greifswald.—Dr. Warenhorst Pasha, senior medical officer of the Deaconesses' Hospital, Alexandria.—Dr. Mathias Duval, professor of histology in the University of Paris and member of the Academy of Medicine.—Dr. F. J. Herrgott, formerly professor of clinical midwifery in Nancy.—Dr. Georg Friedrich Louis Thomas, professor of pharmacology and director of the University Medical Policlinic, Freiburg, at the age of 68 years. In the earlier days of his professional life he was assistant to Dr. Strempel, professor of surgery in Rostock, and afterwards to Wunderlich, the celebrated Leipsic professor of medicine. He was the author of many articles in Ziemssen's "Handbuch" of Special Pathology and Therapeutics.—Dr. Adalbert Tilkowsky, director of the Lower Austrian Lunatic Asylum, Vienna, aged 67 years.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Anthrax in Vienna.

AN epidemic of anthrax, which was quickly extinguished by the energetic measures of the sanitary board, occurred not long ago in this city. The source of infection was found to be hair imported from Russia and the first patient was a carpenter who in his spare time used to make brushes. His wife also contracted the disease from the same source, and four other persons who had all been associated with the two first patients were afterwards attacked. Among these six patients, who were all admitted to hospital, there were four deaths. Before the infected hair—horsehair used for upholstery and brushes—was identified, a careful examination of the cattle in the slaughter-houses of Vienna was made and one case of anthrax was found. Disinfection on a large scale was employed. The difficulty of checking the spread of the disease lay in the fact that many people work at the business at home, especially girls and children, who earn pocket-money by tying the hair in small bundles for sale. The authorities, however, succeeded in tracing all the hair coming from the suspected parcel and seven days have now elapsed since the last case was reported.

New Regulations for the Disinfection of Books and Garments.

A series of new regulations, according to the *Journal of the Sanitary Board*, has been issued with regard to the disinfection of books from circulating libraries and of theatrical costumes if they are worn by different persons. Experiments have shown that there is no absolutely certain method of disinfecting books, but an exposure of two or three hours' duration to the vapour evolved from formalin will not damage the book, whilst it will lessen the virulence of bacteria. The present epidemic of influenza may supply an opportunity of testing the efficacy of the method, because it is well known that many of the adult patients have been in the habit of reading books obtained from lending libraries. Although a clause of the regulations requires notification to the proprietor of any case of illness among the readers, there is no means of insuring that this precaution is observed, and it is therefore now directed that every book returned to the library must be placed standing open in a receptacle or room, where an atmosphere of the vapour given off by formalin is allowed to act on it. Theatrical garments and costumes must be disinfected in a similar way before being handed to a second person for wearing. An action for damages which was recently heard before the High Court of Justice was brought by an actress who alleged that she contracted scabies by wearing an article of dress in which she had to appear on the stage. The action was unsuccessful but the calling of public attention to the matter resulted in the renewal of the old regulation.

Left-handedness and Epilepsy.

In a paper read at a recent meeting of the Medical Society Dr. Redlich discussed the condition known as left-handedness. His observations showed that about 2 per cent. of all men were left-handed, whilst the percentage for the female sex was slightly higher. Among neurotic and mentally unsound persons the proportion of left-handedness was much higher—namely, 8 per cent.—whilst among 125 juvenile epileptics there were 22 left-handed, or a proportion of 17 per cent., and both sexes were equally affected. In ten cases the patients themselves were right-handed, but in their families left-handedness was present. It was possible to distinguish between left-handedness affecting families and that which was of solitary occurrence. Whilst in the majority of cases the aberration from the rule of right-handedness was of a family type, the epileptics showed solitary occurrences in 15 per cent. of the cases and only this form was to be regarded as pathological. The pathological importance of this abnormality in epileptics was proved by the concurring symptoms of unilateral degeneration and of asymmetric development of the face and skull with predominance of the right side of the brain. Left-handedness in epileptics might therefore be explained as an extremely slight degree of paralysis of the right side of the body. Another type of left-handedness, which might be called the secondary type, was due to injury of the cerebral tissue controlling the right upper extremity, such injury having occurred either during fœtal life or in very early infancy, so that an actual paralysis was never observed. Lesions of this kind might be produced by congenital syphilis, by infectious diseases, by meningitis, and by traumatic incidents during labour. Such primary lesions in the brain might prove a centre for the irritation which later in life produced epileptic seizures, so that the frequency of combination of left-handedness and epilepsy was more easily understood. Left-handedness was more often anatomical than functional. In the measurements of the muscles and bones of the upper extremities there was a difference of a centimetre or one and a half centimetres in favour of the left side, and the condition was often masked by the fact that numerous handicrafts and most machines were so arranged as to be worked by the right hand only, and in this way the right hand was made to appear the more useful of the two. But an examination of other organs, such as the eye and the ear, and of the general sensibility, would show that they were better developed on the left side if the individual were left-handed.

Congenital Dilatation of the Colon in a Child.

A case of this rare congenital abnormality was shown at a recent meeting of the Wiener Gesellschaft der Aerzte by Dr. Weiss who had had the patient, now a boy three years of age, under observation from the time of his birth. During the first week of his life he suffered from constipation, incessant vomiting, and a remarkable dilatation of the abdomen. In the second month, however, the alarming

symptoms subsided and the child had a period of six months of good progress, during which his weight reached 7 kilogrammes (15 pounds). Then suddenly the old symptoms re-appeared, the abdomen becoming tympanitic and so tense that the skin was shiny. After repeated irrigations enormous quantities of fæcal matter and fæcal concretions were expelled. The weight of the child fell to 6 kilogrammes and up to his twentieth month he never gained any ground and his weight remained constantly at the same level. In the third year the parents had finally consented to an operation, which would be performed at an early date. Meanwhile the boy was shown with all the symptoms of the disease present. Examination per rectum revealed an enormously dilated rectum and sigmoid flexure without any associated stenosis, and the flaccid abdominal wall allowed the dimensions of the colon to be measured approximately, the estimated circumference being 20 centimetres (eight inches). The operation to be performed would consist in resection of the permanently dilated part of the colon.

March 15th.

CONSTANTINOPLE.

(FROM OUR OWN CORRESPONDENT.)

A Gratuitous Dispensary for Tuberculous Patients.

THERE exists in Constantinople a league which has been constituted with the purpose of fighting against the pest of tuberculosis. The council of administration of this league decided at one of its last meetings to establish a dispensary where people of any creed and nationality suffering from tuberculosis could receive medical treatment free of charge. It is intended to erect the charitable establishment with as little delay as possible and in a central position of the metropolis. It will be worked in the same manner and on the same principles as similar institutions existing in the western parts of Europe. The medical men belonging to the league will alternately attend the dispensary at certain fixed hours of the day. Treatment will also be accorded to patients suffering from any malady affecting the respiratory organs.

Medical Supervision of Servants.

The local newspapers announce that all domestics and servants will be submitted henceforward to a professional tax and to a medical examination. In case they prove to be free from any taint and satisfactory with regard to their family history they will receive a licence permitting them to enter in service. It is also stated that the municipal authorities have received the necessary injunctions to put into execution this new measure of safeguarding public interests.

Typhoid Fever.

Typhoid fever is raging in several suburbs of the metropolis. In Haskeuy alone, on the left bank of the Golden Horn, more than 90 cases have been reported in a comparatively short period of time. The number of deaths has not been stated definitely but it is supposed to be proportionately high. The sanitary authorities are naturally alarmed at this state of things and are taking the necessary measures of prevention. Réshid Pasha, the prefect of Constantinople, has ordered that all the drains and fountains should be properly examined and the necessary repairs made.

Opium Smoking.

It has been found that the business quarter of Galata superabounds in localities where the habit of opium smoking is indulged in by many people in a rather alarming manner. These localities remain open the whole night and frequently serve as gathering places of all sorts of obscure and dangerous individuals. The police authorities have received strict commands to shut up these places and to prosecute their proprietors.

The Maternity Section of the Italian Hospital.

The Italian Hospital of Constantinople has opened a maternity section for the poorer classes of the population, under the charge of Dr. Stavridis. On Tuesday, Wednesday, and Friday mornings there will be a gratuitous outpatient consultation when pregnant women will be examined by midwives and the medical man in charge. Each of these pregnant women, if desiring to enter the maternity clinique at the approaching term of pregnancy, will have to write down her name in the register kept at the hospital for that purpose and to occupy the bed assigned to her. If a woman wishes to be delivered in her own home she will be furnished with information and assistance. The rooms of the section are equipped with every requirement of modern hygiene and antisepsis and the departure should prove a veritable boon to indigent mothers.

March 8th.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council of the above College held on March 14th the diploma of Fellow was conferred upon the following gentlemen who have previously passed the requisite examinations and have now complied with the by-laws of the College:—

Lionel Edward Close Norbury, M.B., B.S. Lond., M.R.C.S., L.R.C.P., St. Thomas's Hospital; and Gerald Charles Frederick Robinson, M.R.C.S., L.R.C.P., Guy's Hospital.

The diploma of Member was granted to—

Henry Orton Howitt, M.D., C.M. McGill University, McGill University and London Hospital.

A licence to practise Dental Surgery was issued to—

Thornton John Barnett, Charing Cross and Royal Dental Hospitals.

UNIVERSITY OF OXFORD.—Election of Chancellor: In a convocation held on March 14th the Right Hon. George Nathaniel, Lord Curzon of Kedleston, M.A., Hon. D.C.L., All Souls' College, was elected Chancellor of the University.—Degree of D.M.:—In a congregation held on March 14th the following degree in medicine was conferred: Doctor of Medicine, J. Freeman, University College. A scholarship in Natural Science is announced for competition on July 2nd at Brasenose College. Degree days:—The degree days for next term are the following: Thursday, May 2nd, at 10 A.M.; Saturday, May 25th, at 2.30 P.M.; Thursday, June 20th, at 10 A.M.; Thursday, June 27th, at 10 A.M.; and Saturday, July 6th, at 10 A.M.—Official Fellowship in Natural Science at Jesus College: The Principal and Fellows will shortly proceed to elect to an official Fellowship, to be held in conjunction with an assistant tutorship in natural science. The Fellow so appointed will be expected to teach one of the larger subjects recognised in the honour school of natural science, to undertake the entire direction of the science tuition of the college and generally to superintend the college laboratory now in course of erection; this, when completed, will be adapted for the teaching of chemistry and physics. He must be a graduate of some university within the United Kingdom and must be unmarried. His duties will commence at the beginning of the October term, 1907, and he will be required to reside in college during full term. The emoluments will be those of an official fellowship, together with such a sum from the tuition fund as the college may from time to time determine, the whole stipend being not less than £450 per annum, together with the free use of rooms in college, and the usual allowances. Applications, together with a statement of the candidate's qualifications and experience, and such testimonials as he may desire to submit, should be sent, not later than May 1st next, by letter, to the Principal, Jesus College, from whom further details, including the conditions of tenure of an official fellowship, may be obtained. All letters addressed to the Principal on this subject should bear the words "Science Fellowship" upon the envelope.—On Thursday, March 14th, Dr. Charles Theodore Williams lectured before the Oxford Medical School on Laennec and the Discovery of Auscultation. He showed a remarkable series of stethoscopes; among the most interesting was one of the original forms devised by Laennec, and, indeed, made by Laennec himself, which was given to the lecturer's father, Dr. C. J. B. Williams. A large collection of the different forms of single stethoscopes were shown and a double stethoscope made by Dr. C. J. B. Williams in 1829 probably represents the first attempt of this kind. The ear-piece consisted of flexible metal. The advantages of the double stethoscope were discussed and a large number of different patterns were shown, including the demonstration stethoscope with which ten or 12 men can listen at once to a patient's heart or lungs. An interesting sketch was given of the life of Laennec and the various French and English editions of his work were exhibited.—Dr. C. Theodore

Williams has founded a scholarship in medicine of the value of £100 at his old college, Pembroke.

COLONIAL MEDICAL OFFICERS.—Mr. G. B. Mason, medical officer of Nevis, West Indies, has been promoted medical officer and magistrate of the Windward district of the Island of Dominica. Dr. F. G. Hopkins, senior medical officer of Southern Nigeria, has been promoted deputy-principal medical officer, and Mr. E. H. Read, medical officer, has become senior medical officer.

THE MEDICAL GOLFING SOCIETY.—The Medical Golf Tournament will take place on Thursday, May 30th, and application has been made to the Burnham Beeches Golf Club for permission to play off the event on its links. To secure the continuity from year to year of this popular fixture and to promote the interest of golf among medical practitioners there has been founded the Medical Golfing Society, with an annual subscription of 4s., the payment of this sum including entrance to the tournament. Any person on the Medical or Dental Registers can join by sending 4s. to the honorary treasurer, Medical Golfing Society, 1, New Cavendish Mansions, New Cavendish-street, London, W., and there seems no reason why the new society should not be as much of a success as the similar institutions supported by the Bar and the Stock Exchange.

THE old-established medical publisher Mr. H. K. Lewis has just completed an important extension of premises at 136, Gower-street by the inclusion of 24, Gower-place adjoining. The two shops have been made into one, the older portion being utilised chiefly as the second-hand department. The library is entered from the end of the shop. Subscribers will be able to examine the books on the shelves when making exchanges, and convenience for writing or making extracts will be provided, the idea being to make this department a reading room for subscribers. The telephone in this room is free for subscribers' use. Lavatory accommodation is also provided. The premises are, as is well known, within a minute's walk of the Metropolitan station, and the new Tube station at the junction of Tottenham Court-road, Euston-road, and Hampstead-road is quite near.

DONATIONS AND BEQUESTS.—By the will of the late Surgeon-General Richard Chapman Lofthouse the balance of his property, if not exceeding £3000, is to be divided equally between the Harrogate Bath Hospital, the Harrogate Convalescent Home, the Harrogate Cottage Hospital, and the Yorkshire Home for Incurables. If it shall amount to £4000, then £1000 are to go to the pension fund of Epsom College. Should certain schemes mentioned in the will be not carried out he left £1500 to the pension fund of Epsom College and the balance (over £40,000) equally between the four Harrogate charities above named.—£250 have just been received by the special appeal committee of the Royal Waterloo Hospital, S.E., from Mr. Otto Beit, executor of his brother's (the late Mr. Alfred Beit) estate. Also a seventh donation of £100 from "A. B." and smaller sums from the following City Companies—viz., the Leathersellers, Carpenters, Armourers, and Braziers.

THE OXFORD EYE HOSPITAL.—The twentieth annual report of this institution for the year 1906 has just been issued and we are glad to see that the notes about the hospital staff and the record of the committee's thanks to the honorary surgeons are the second item in the report and are not relegated to three lines at the end as a sort of after-thought after the expression of the thanks of the committee to the people who send eggs, old clothes, picture postcards, and other gifts, for this, we regret to say, is the custom of many hospital and dispensary committees. The medical work of the hospital during the year 1906 was made all the more difficult by the serious illness of Mr. R. W. Doyne, and in the absence of Mr. F. Menteith Ogilvie the work of the hospital was carried on by Mr. P. E. H. Adams, the assistant surgeon, and by Mr. Donald Gunn, formerly surgeon to the Westminster Ophthalmic Hospital, who gave valuable help on out-patient days while the emergency lasted. The medical report shows that various alterations in the out-patient department have been carried out, so that it is possible to do more work, and that better than before. The total number of attendances during the past year was 8483. The number of operations performed has slightly increased, but the number of eyes which have had to be excised is less than usual. Mr. Adams attributes this improvement chiefly to the fact that people are abandoning home treatment and attend the hospital before the eye is irretrievably damaged. Certain research work has been done at the hospital and the annual post-graduate course, which is held in July, was well attended by medical men. Altogether the institution, which is the only fully-equipped hospital devoted to the treatment of injuries and diseases of the eye between London on one side and Birmingham on the other, seems to be doing excellent work; tickets of admission are not necessary, the sole passport being inability to pay for private treatment. The member of the committee acting as a visitor for the week makes the inquiries necessary for ascertaining the eligibility of applicants for admission into the hospital or for treatment as out-patients.

THE LATE DR. ADAM JAMESON.—Dr. A. Jameson, who recently was killed, at the age of 46 years, in a railway accident to the Delagoa Bay train while on his way home after retiring from the post of Commissioner of Lands in the Transvaal, was educated at Edinburgh and took the M.B. and C.M. degrees of the University of that city in 1883. The subject of his thesis for the M.D. degree, which he obtained in 1897, was "Malarial Fever." Later he went to Australia, where he practised for a few years and afterwards entered the Legislative Council of the colony and became Minister for Lands and the official leader of the Council. Subsequently he went to South Africa and in 1903 was appointed Commissioner of Lands in the Transvaal. He was a member of the Executive and Legislative Council at Pretoria.

RUSSIAN FACTORIES AND MEDICAL AID.—Under the heading of "Medical Aid to Workpeople in the Factories of the Mining and Metallurgical Industries" the *Viestnik Finansseff* observes that according to statistics published by the Mining Department there were in the year 1904 in European Russia and the Caucasus 3833 mining concerns, with a total of 426,334 workpeople. In these factories there were 214 hospitals with 4244 beds and 355 apartments. The cost of installing the hospitals, the apartments, and the ambulances was 5,482,972 roubles, and the annual expenditure on medical aid was 2,866,275 roubles, or an average of 6·72 roubles per head. In Asiatic Russia in the same year there were 650 mining works with a total of 54,744 workpeople. In these factories there were 127 hospitals with 1025 beds and 171 apartments. These cost (hospitals, apartments, and ambulances) 412,566 roubles, and the annual expenditure on medical aid was 445,337 roubles, or 8·13 roubles per head of the workpeople.

SOCIETY OF MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—On March 14th a deputation from this society was received by the Lord President of the Council in reference to a memorial recently submitted to the Prime Minister, asking that some voice in the management of the College and its property might be given to the Members of the College. The deputation was introduced by Dr. V. H. Rutherford, M.P. Mr. Joseph Smith gave a short account of the history of the College, drawing attention to the fact that Members had made this claim from time to time ever since the first Charter was granted in 1800. He pointed out that the undoubted corporate rights of the Members as such did not carry with them as they should do any vote in the election of the Council or governing body. He referred to the fact of there being some 17,000 Members thus excluded, as against 1300 Fellows who alone have a vote at present. He also showed that a very large proportion of the income of the College is derived from the Members' fees. The Lord President inquired whether, apart from their general claim for representation, the deputation made any specific charges against the present governing body. Dr. W. G. Dickinson stated that no accusation of gross mismanagement was made against the Council, though they naturally considered that the management could be improved in various ways. The Lord President, in reply, said that he had listened with interest to the statements which had been made respecting the position of the Members, and he thought that the deputation had stated their case, on the whole, with great moderation. He agreed that it was anomalous that the representation in the College should be so limited. He would give the matter his closest attention and would endeavour, so far as possible, to act as a mediator in smoothing over the differences which had arisen between the Council and the Members. The deputation would not expect him to say more than this at present and he would probably have to ascertain the views of the

Council of the College in greater fulness. The deputation then thanked his lordship and withdrew.

AT the first meeting of the new Pembrokeshire county council held on March 15th Mr. George Griffith, J.P., M.R.C.P. Edin., M.R.C.S. Eng., was unanimously elected chairman.

LONGEVITY.—The *Times* of March 18th states that on the previous day Mrs. Wenham, of Stramshall, the Park, Highgate, in North London, celebrated the 102nd anniversary of her birth. Mrs. Wenham enjoys good health and frequently takes a carriage drive.

ROYAL SEA-BATHING HOSPITAL, MARGATE.—The Earl of Derby presided at the annual court of governors of the Royal Sea-Bathing Hospital on March 13th and in moving the adoption of the report remarked that it contained in a condensed form a great deal of useful matter and showed that the institution was making steady progress. The necessity of early treatment of surgical tuberculosis in suitable surroundings did not yet appear to be realised sufficiently by the public and doubtless many cripples could have been prevented from becoming so had they applied for treatment at the Royal Sea-Bathing Hospital when they were first attacked by the disease. With regard to the proposed building of four new wards over the Wilson Wing, his lordship remarked that until this was done the hospital could not be said to meet modern requirements; the construction of these wards would set free certain old wards for accessory purposes not formerly contemplated, but which were now positively necessary in a modern up-to-date hospital. Lord Biddulph, treasurer, and Sir Henry Lennard, Bart., chairman of the committee of management, spoke of the need for better day rooms, a better dispensary, and a larger electrical department. Mr. Stuart Sankey, L.C.C., seconded the adoption of the report and referred to the fact that £3476 were received as patients' payments and trusted that this sum might be provided by increased public support and the patients treated free.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Nurses' Registration Bill.

Mr. MUNRO FERGUSON has presented a Bill to regulate the qualifications of trained nurses and to provide for their registration. It has been read a first time and receives support from Members amongst all parties in the House of Commons. Its backers include Sir JOHN DICKSON-POYNDER, Mr. ROSE, Mr. RAINY, Mr. EVE, Mr. FELL, Mr. CROOKS, Sir GEORGE ROBERTSON, Dr. V. H. RUTHERFORD, Mr. JOWETT, and Mr. MCKILLOP. The Nurses' Registration Bill provides for the appointment of a council to regulate the admission to the register of persons trained as nurses. During the two years following the passing of the Bill into law, any person who claims to be certified as a trained nurse shall be so certified provided such person is at least 21 years of age and (1) holds a three years' certificate of training from a general hospital or Poor-law infirmary approved by the council, and is of good character; or (2) produces evidence of training satisfactory to the same authorities and has in addition been for at least three years in *bond fide* practice as a nurse and is of good character. At the expiration of two years after the passing of the Bill any nurse claiming to be certified under it shall have completed a three years' term of training in the wards of a hospital or Poor-law infirmary approved of by the council and shall verify his or her qualifications for being so certified by such means as the council may prescribe.

Afflicted Children in Ireland.

A Bill has been presented in the House of Commons by Mr. CHARLES CRAIG to provide for the better education of afflicted children in Ireland. It was read a first time.

The Relief of Discharged Invalid Prisoners.

A Bill designed to make better provision as to the relief of persons released from detention in prisons, reformatory and industrial schools, and inebriate reformatories has been presented in the House of Commons by Mr. HERBERT SAMUEL, the Under Secretary for the Home Department, and the measure is backed by Mr. GLADSTONE. At present an administrative difficulty frequently arises when a person who is due for discharge from a prison is destitute and in such an infirm state of health as to require immediate Poor-law relief. It is the duty of the governor of the prison to see that the invalid shall receiver proper care on his discharge. Where the place of settlement can be ascertained an order for the admission of the discharged prisoner to the workhouse of the union can be applied for. However, in practice it has been found that frequently the place of settlement cannot be ascertained or that it is disputed. The only course in this case at present is to take the discharged prisoner to the workhouse of the union in which the prison is situated, but this, in the case of a large prison, imposes an appreciable liability on the ratepayers of the district in which it is situated. The Bill, which is officially entitled the Released Persons (Poor-law Relief) Bill, proposes to remedy the evil by following the precedent of the Criminal Lunatic Act, 1884. It throws the *primâ facie* liability for the relief of an invalid prisoner whose place of settlement is unknown on the union in which he ordinarily resided at the time he committed the offence for which he was sent to prison, or, if that cannot be ascertained, on the union where the offence was committed. The guardians of the union to which he is sent in the first instance will be able afterwards, if they see fit, to take steps for his removal to his place of settlement. The same difficulty has been experienced in dealing with invalid persons discharged from reformatory and industrial schools and inebriate reformatories. The Bill proposes to follow the same procedure in dealing with these persons as with discharged prisoners.

Dental Companies (Restrictions of Practice) Bill.

Lord HYLTON has introduced into the House of Lords a Bill to prohibit joint-stock companies from carrying on practice as dentists or dental surgeons except by means of duly qualified persons. The Bill has been read a first time. Lord HYLTON explains the provisions of the existing law and the alterations which he proposes to make in it, in the course of a memorandum attached to his Bill. The memorandum sets forth that in many cases companies under the existing law have been formed by persons who have no qualifications entitling them under the Dentists Act, 1878, to practise dentistry and dental surgery, and these companies are carrying on dental practice by means of unqualified persons or assistants. The provisions of the Dentists Act, 1878, for the protection of the public against unqualified and ignorant practitioners, are thus systematically evaded. The effect of the Bill is to declare it unlawful for a company to practise dentistry or dental surgery, except by means of managers, assistants, or other persons, each of whom is duly qualified to practise dentistry and dental surgery by registration under the Dentists' Act, 1878. The Bill further declares that whatever would be an offence under the Dentists Act when committed by an individual person shall also be an offence when committed by a number of persons formed and incorporated into a company. The Bill applies only to the carrying on by limited companies (including joint-stock companies and companies limited by guarantee) of the professional practice of dentistry and dental surgery. It does not apply to the carrying on of the purely mechanical business of the manufacture, sale, and repair of dental appliances. The Bill has the support of the General Medical Council. Enactments to the same effect have already become law in various parts of the British dominions.

Prohibition of Medical Practice by Companies Bill.

A Bill entitled the Prohibition of Medical Practice by Companies Bill has been introduced into the House of Lords by Lord HYLTON. Its object is to prohibit persons who are not by examination and registration legally qualified to practise medicine and surgery from carrying on business as medical practitioners by means of companies formed under the Joint Stock Companies Acts, under shelter of which they are able to evade liabilities attaching to them as individuals. By the Medical Acts penalties are imposed on an unqualified person who falsely assumes the designation of a legally qualified medical practitioner. Lord HYLTON, in an explanatory memorandum to his Bill, states that it has been ascertained that for some time past unqualified persons have had recourse to the machinery established by the Companies Acts, to enable them to carry on medical practice by forming companies for that purpose, and that companies so formed have been, and are, carrying on medical practice on a very large scale, especially among the poorer classes. The provisions of the existing law have been found insufficient to put a stop to such practices. It has even been possible under the existing law for a medical practitioner, whose name has by direction of the General Medical Council been erased from the Medical Register for crime or misconduct, to evade the consequences of the Council's judgment by forming a company under cover of which the practitioner may continue to practise as if he were still duly qualified. The Bill accordingly declares that whatever would be an offence under the Medical Acts when committed by an individual person shall also be an offence when committed by a number of persons formed and incorporated into a company.

Lord HYLTON further states in his memorandum that the effect of the Bill is to make it unlawful for a company formed under the Companies Acts (which includes a joint stock company or a company limited by guarantee) to practise as, or to carry on the business or profession of, a physician, surgeon, or medical practitioner. The Bill applies to existing companies but does not apply to companies formed to carry on business as manufacturers or sellers of medical, surgical, or dental appliances or preparations, pharmaceutical chemists, or chemists and druggists. Nothing in the Bill will prevent a limited liability company from carrying on convalescent homes, hydropathic establishments, and other institutions, of which the primary object is not the actual conduct of medical practice by unqualified persons; or will interfere with friendly

and other societies established for affording mutual relief in sickness and old age, or for assisting their members to obtain the services of duly qualified medical practitioners. The Bill has the support of the General Medical Council. Enactments to the same effect have already become law in various parts of the British Dominions.

The Education Acts (Amendment) Bill.

The Education Acts (Amendment) Bill, which contains provisions as to the medical inspection of elementary school children, has passed through its committee stage, and been reported to the House of Commons.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 13TH.

Municipal Milk Depôts.

Sir FREDERICK BANBURY asked the President of the Local Government Board whether he proposed to introduce legislation dealing with municipal milk depôts.—Mr. JOHN BURNS replied (in a written answer): Yes, I propose to do so.

THURSDAY, MARCH 14TH.

The Standardisation of Disinfectants.

Mr. REES asked the President of the Local Government Board whether, in view of the prevalence of the sale of disinfectants which did not disinfect, he proposed to take any steps towards the standardisation of disinfectants.—Mr. BURNS answered: I am not empowered to fix standards of disinfectants and it does not appear to me that I could usefully take action in the matter.

The Feeble-minded and Illegitimacy.

Mr. WEDGWOOD asked the President of the Local Government Board whether he would cause registers to be kept by the medical officers of all workhouses and infirmaries of feeble-minded females who were delivered therein of illegitimate children; and whether he would lay upon the table, or otherwise publish, an annual summary of such registers.—Mr. BURNS answered: I will take note of the suggestion of my honourable friend, but I think it will be desirable to defer any action in the matter pending the report of the Royal Commission on the Feeble-minded. I understand that the Commissioners are now engaged on their report.

What is Whisky?

Mr. H. C. LEA asked the President of the Local Government Board what steps had been taken by his department to appoint a committee to inquire into and settle the question of what was whisky, having in view the postponement of the appeal against Mr. Fordham's decision.—Mr. BURNS said, in reply: It appeared to me to be desirable that before I determined to take action of the kind referred to in the question the decision of the court of quarter sessions on a re-hearing of the appeal should be given, and I expressed an opinion to this effect. Further representations have, however, recently been made to me on the subject and these are now receiving my consideration. I may add that any committee appointed by me could only inquire into the matter. It would have no power to settle it.

Insanitary Conditions in St. Pancras.

Mr. LEA asked the President of the Local Government Board whether he had yet received a report from the medical officer of health of the borough of St. Pancras on the insanitary condition of Little Clarendon-street, Somers Town, which report he stated that he had called for; also, what action, if any, had been taken by the borough council to deal with this insanitary property under the Housing of the Working Classes Acts, 1890 to 1903; and if no action had been taken either by the borough council referred to or the Local Government Board, whether he would explain the cause of the delay.—Mr. BURNS replied: I have received the report referred to. It shows that the houses in question are in fair structural condition and that no fault is to be found with the supply of light and air. Overcrowding, however, exists in the street, and a large number of notices for its abatement are served from time to time. The case appears to be one for action under the Public Health (London) Act, 1891, rather than under the Housing of the Working Classes Acts, and I gather that the borough council is exercising its powers under the former Act.

Workmen's Compensation Act.

In reply to Mr. BRACE, Mr. GLADSTONE said: All cases where the accident happens after July 1st, 1907, will be under the new Workmen's Compensation Act. All cases where the accident happens before July 1st, 1907, will be under the old Acts, except with respect to references to medical referees as to which the new provisions will apply.

Lunacy in Egypt.

Dr. V. H. RUTHERFORD addressed a series of questions to the Secretary of State for Foreign Affairs regarding the allegation in the report of the director-general of the Egyptian lunatic asylum for 1905, that many dangerous lunatics had to be discharged uncured owing to insufficiency of accommodation and also regarding the promised introduction of a lunacy law.—Sir EDWARD GREY in each case referred the honourable Member to Lord Cromer's report for 1906, which would shortly be published.

Water-supply of Ardler, Perthshire.

In reply to Mr. WILKIE, Mr. SINCLAIR said: My attention has been called to the unsatisfactory state of the water-supply of the village of Ardler (Perthshire). The county medical officer has reported that in the autumn of 1905 a number of children in Ardler and other parts of the county suffered from "broken-out faces," but that there was no reason to connect these with the water-supply. The Local Government Board is in communication with the local authority with a view to an improved supply.

Mr. LUPTON: Will the right honourable gentleman inquire whether the breaking-out of the faces of the children is, or is not, due to vaccination?—No reply was given.

MONDAY, MARCH 18TH.

Dr. Duncan's Dismissal.

Mr. CATHCART WASON asked the Secretary for Scotland whether his attention had been directed to the facts of Dr. G. Duncan's dismissal; that the reason given—viz., the refusal of Dr. Duncan to implement the agreement entered into by him with the parish council was incorrect; and that Dr. Duncan had been and was ready to carry out any arrangement or agreement entered into by him with the parish council; and if it was possible for him to take any action with the view of checking any injustice.—Mr. SINCLAIR said in reply: I understand that the statement made in reply to my honourable friend's question of Feb. 26th, that Dr. Duncan failed to implement an agreement made with him three years ago to appoint an assistant, is correct, and that his recent offer to carry out this arrangement was held by the parish councils employing him to have come too late.

The Medical Inspection of School Children.

Mr. JOWETT asked the President of the Board of Education what would be the probable cost of medical inspection under the Education (Administrative Provisions) Bill; and whether the grant would be in any way influenced by such inspection as was carried out by local education committees.—Mr. MCKENNA replied by written answer: I have no information as to the probable cost of medical inspection. The grants, other than those governed by statutes, are paid in respect of the efficiency of instruction and are not affected by any efforts which local education authorities may make in other directions.

Mr. JOWETT further asked the President of the Board of Education whether he would state what expert staff it was proposed to provide at the Board of Education to advise as to sanctioning arrangements under Clause 10 (b) of the Education (Administrative Provisions) Bill; and would there be any machinery, by inspection or otherwise, for standardising or insuring efficiency in the medical measures carried out by the local authorities and for reporting to the Minister for Education on the valuable scientific materials of educational value likely to become available.—Mr. MCKENNA answered: I think it would be premature at this stage to decide what machinery will be required by the Board of Education on the Education (Administrative Provisions) Bill becoming law, but the matter is having my careful consideration and the honourable Member's suggestions will not be lost sight of.

Rural Medical Officers of Health.

Sir WALTER FOSTER asked the President of the Local Government Board whether his attention had been drawn to statements made by Local Government Board medical inspectors in reports by them, quoted in the report from the Select Committee on the Housing of the Working Classes Acts Amendment Bill, to the effect that certain medical officers of health and inspectors of nuisances in rural districts were, in fact, receiving inadequate salaries; whether the Local Government Board had recommended the repayment of a moiety of the salaries by the county councils in these cases; and, if so, whether it had received the consideration of the Board that they were thereby placed in the position of giving their approval to salaries which had been stated by their inspectors to be inadequate for a proper discharge of the duties required of such officers.—Mr. JOHN BURNS replied by written answer: It is only as regards some of the districts in question that inspectors have in their reports directly referred to the salaries of the sanitary officers as inadequate. In most of these cases the Local Government Board had, prior to the inspector's visit, refused or threatened to refuse to sanction the appointment of all or some of the officers concerned. The visit of the inspector has usually led to a more satisfactory arrangement being made than that which previously existed, so that the Board has been able to sanction the appointments with a view to repayment of half the salaries by the county council.

The Case of Dr. Haffkine.

Sir WILLIAM COLLINS asked the Secretary of State for India whether Dr. Haffkine now held any appointment under the Indian Government; whether the use of Dr. Haffkine's prophylactic against plague was now encouraged by the Government; and whether any further information had been obtained in regard to 19 fatal cases of tetanus at Mulkowal consequent upon the use of Dr. Haffkine's prophylactic.—Mr. MORLEY (by written answer) replied: Dr. Haffkine is in the permanent service of the Government of India and is at present on leave in this country. He holds no appointment in India, but the Government of India has offered him employment in that country on research work at a salary equal to that of which he was in receipt when he left India. Inoculation with Dr. Haffkine's prophylactic continues to be one of the precautions which are recommended by Government to the general population against outbreaks of plague, and facilities are provided for persons who wish to be inoculated. Papers containing the results of the inquiry into the origin of the accidental deaths from tetanus poisoning in the Punjab have recently been published by the Government of India. I have no objection to lay them if they are moved for.

WEDNESDAY, MARCH 20TH.

Parochial Medical Officers (Scotland) Bill.

Mr. CATHCART WASON asked leave to bring in under the ten minutes' rule a Bill "to amend the law relating to the tenure of parochial medical officers of Scotland." He said that he would take the occasion to bring before the Government and the country a long-standing grievance of the medical profession in the Highlands and islands of Scotland. The Poor-law medical officers in Scotland had, since the passing of the Local Government Act of 1894, found that their position had altered for the worse. A number of dismissals had taken place on petty grounds. Representations had been made on this point to successive Secretaries for Scotland, and from the reception accorded to a deputation last year he had no reason to believe that the present occupant of that office held any antagonistic view to the contentions of the medical profession. It was a gross scandal and injustice that Poor-law medical officers in the north of Scotland had been dismissed on scanty grounds. The Bill asked that these gentlemen should go to the Local Government Board for Scotland and have their case heard by it. The medical officers of poor houses in Scotland had had that right during the last five years and in consequence of it there had not been one application from them to the Local Government Board. To give Poor-law medical officers this right of appeal when they were threatened with dismissal would only be a small act of justice.

Leave having been given Mr. WASON introduced his Bill which was read a first time.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week such information for gratuitous publication.*

BERGIN, FRANK GOWER, L.R.C.P., M.R.C.S., has been appointed House Surgeon at the Bristol General Hospital.

BLACKETT, JAMES FRANCIS, M.B., B.S. Lond., has been appointed Assistant House Physician at the Bristol General Hospital.

BRISCOE, WILLIAM THOMAS, M.D., M.Ch. Dub., has been appointed Medical Officer for the Pewsey District by the Chippenham (Wilts) Board of Guardians.

CAREY-EVANS, T. J., M.D. Brux., M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon at the Royal Southern Hospital, Liverpool.

COLEMAN, F., M.R.C.S., L.R.C.P., L.D.S. Eng., has been appointed Assistant Dental Surgeon at St. Bartholomew's Hospital.

COULSON, THOMAS EDMUND, M.B., Ch.B. Edin., has been appointed Senior House Surgeon at the Bristol General Infirmary.

ELLIOTT, WILLIAM HAROLD ARTHUR, M.B., B.S. Lond., L.S.A., has been appointed Medical Officer to the Bristol Dispensary.

HEWKLEY, FRANK, M.B., F.R.C.S., has been appointed Honorary Surgeon with charge of the Ophthalmic Department at the St. Pancras and Northern Dispensary.

HUGHES, EDWARD BLYTHE HURST, L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Resident Medical Officer at the Newport (Mon.) Workhouse.

KINGSCOTE, ERNEST, M.B., C.M. Edin., has been appointed Honorary Physician to the St. Pancras and Northern Dispensary.

MACKAY, ERNEST C., B.S., M.D. Lond., M.R.C.S., L.R.C.P. Lond., has been appointed Honorary Medical Officer to the Convalescent Home of the Chelsea Hospital for Women.

MILLER, A. H., M.D., B.C. Cantab., has been appointed Resident Medical Officer to Out-patients at Queen Charlotte's Hospital.

MORRIS, LEONARD NEWSOM, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed House Physician at the Bristol General Hospital.

O'DONOVAN, T. J., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Johnstown District of the county of Cork.

PINNIGER, WILFRID J. H., M.B., B.S. Lond., L.R.C.P., M.R.C.S., has been appointed Casualty House Surgeon to the Bristol General Hospital.

POWELL, HUGH, M.D., M.R.C.S., L.R.C.P. Lond., has been appointed Honorary Surgeon to the Cheltenham General Hospital Branch Dispensary and Assistant Obstetric Surgeon to the District Nursing Association.

POWER, J. H., M.R.C.S., L.R.C.P. Lond., has been re-appointed Medical Officer to the Spalding Union Board of Guardians.

TAYLOR, J. FRANCIS, M.R.C.S., D.P.H., has been appointed Medical Officer of Leyton.

THOMPSON, THEODORE, M.D. Cantab., M.R.C.P. Lond., F.R.C.S. Eng., has been appointed Assistant Physician at the London Hospital.

WADE, REGINALD, M.R.C.S., L.S.A., has been appointed Medical Officer of Health for the Highbridge (Somerset) Urban District.

WILSON, MURRAY RICHARD ORMOND, L.R.C.P., M.R.C.S., has been appointed Casualty House Surgeon to the Bristol General Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BIRMINGHAM, UNIVERSITY OF.—Demonstratorship in Anatomy. Stipend £150 per annum.

BLACKBURN AND EAST LANCASHIRE INFIRMARY.—Senior House Surgeon and Junior House Surgeon. Salary £110 and £70 per annum respectively, with board, washing, &c.

BODMIN, CORNWALL COUNTY ASYLUM.—Third Assistant Medical Officer, unmarried. Salary £140 a year, rising to £160, with rooms, rations, laundry, and attendance.

BOURNEMOUTH, ROYAL BOURNEMOUTH AND WEST HANTS HOSPITAL.—House Surgeon for six months. Salary £80 per annum, with board, lodging, and washing.

BRISTOL EYE HOSPITAL.—House Surgeon. Salary £80 per annum, with board and residence.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Gray's Inn-road, W.C.—Assistant Surgeon.

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Clinical Assistant.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park E.—House Physician for six months. Salary at rate of £50 per annum, with board and residence.

COVENTRY AND WARWICKSHIRE HOSPITAL.—Junior House Surgeon for six months. Salary £60 per annum, with rooms, board, washing, and attendance.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant Resident Medical Officer, unmarried, for six months. Salary at rate of £50 a year, with board, lodging, and laundry.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—Clinical Assistants for three months.

EXETER, ROYAL DEVON AND EXETER HOSPITAL.—Assistant House Surgeon, unmarried. Salary £60 per annum, with board, lodging, and washing. Also House Surgeon. Salary £120 per annum, with board, apartments, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident House Physicians for six months. Honorarium of £25.

HUDDERSFIELD INFIRMARY.—Senior Assistant and Junior Assistant House Surgeon. Salaries £80 and £50 respectively per annum, with board, rooms, and washing.

INGHAM INFIRMARY AND SOUTH SHIELDS AND WESTOE DISPENSARY.—Assistant House Surgeon. Salary £75 per annum, with residence, board, and washing.

LEEDS GENERAL INFIRMARY.—Resident Casualty Officer. Salary £125 per annum, with board, lodging, and washing.

LEEDS PUBLIC DISPENSARY.—Two Junior Resident Medical Officers. Salary £100 per annum, with board and lodging.

LEEK, STAFFORDSHIRE COUNTY ASYLUM, Cheddleton.—Junior Assistant Medical Officer. Salary £150 per annum, rising to £200, with board, quarters, and washing.

LEICESTERSHIRE AND RUTLAND ASYLUM, Leicester.—Second Assistant Officer, unmarried. Salary £130, rising to £160, with apartments, board, and washing.

MANCHESTER, CHILDREN'S HOSPITAL, Pendlebury.—Assistant Medical Officer. Salary £100 per annum.

METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL, Grafton-street, Fitzroy-square, W.—Three Senior Clinical Assistants.

NEWPORT AND MONMOUTHSHIRE HOSPITAL.—Junior Resident Medical Officer. Salary £70 per annum, with board, residence, and laundry.

NOTTINGHAM CHILDREN'S HOSPITAL.—House Surgeon (female) for six months. Salary at rate of £80 per annum, with board, residence, and washing.

RICHMOND, SURREY, ROYAL HOSPITAL.—Assistant House Surgeon. Salary £70 per annum, with board and apartments.

ROYAL EAR HOSPITAL, Dean-street, Soho, W.—House Surgeon, non-resident, for six months. Honorarium at rate of £40 per annum.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Refraction Assistant. Salary £25 a year, with lunch.

ROYAL SOUTH LONDON DISPENSARY.—Honorary Surgeon-Dentist.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Junior House Surgeon. Salary £80 per annum, with board and residence.

SEAMEN'S HOSPITAL SOCIETY, Greenwich, S.E.—For DREADNOUGHT HOSPITAL: Two House Physicians and Two House Surgeons. Salary in each case £50 per annum, with board, residence, and washing.—For BRANCH HOSPITAL, Royal Albert Dock, E.: Senior House Surgeon and Registrar, also House Surgeon. Salary of former £100 per annum, and of latter £50 per annum, with board, residence, and washing.

SHEFFIELD UNION HOSPITAL.—Resident Medical Officer and Resident Assistant Medical Officer. Salary of former £100 per annum and of latter £80 per annum, with allowances, apartments, rations, &c., in each case.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—House Surgeon. Salary £100 per annum, with rooms, board, and washing. Also Junior House Surgeon for six months. Salary at rate of £60 per annum, with rooms, board, and washing.

STAFFORD, STAFFORDSHIRE GENERAL INFIRMARY.—Assistant House Surgeon. Salary £82 per annum, with board, residence, and laundry.

SUNDERLAND INFIRMARY.—House Surgeon. Salary £80 per annum, with board, residence, and washing.

TOTTENHAM HOSPITAL, London, N.—Honorary Medical and Surgical Registrars.

WEST BROMWICH DISTRICT HOSPITAL.—Resident Assistant House Surgeon, unmarried. Salary £50 per annum, with board, residence, and washing.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—Resident House Surgeon. Salary £120 a year, with board and lodging.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Senior House Surgeon. Salary £100 per annum, with board, lodging, and laundry. Also Second House Physician. Salary £80 per annum, with board, lodging, and laundry.

WREXHAM INFIRMARY.—Resident Medical Officer. Salary £80 per annum, with board, lodging, and washing.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Bourne, in the county of Lincoln; at Inistiogn, in the county of Kilkenny; and at Stanmore, in the county of Middlesex.

Births, Marriages, and Deaths.

BIRTHS.

MURIEL.—On March 15th, at Scotch-street, Whitehaven, the wife of G. Bertram Muriel, B.A., M.B., B.C. Cantab., M.R.C.S. Eng., L.R.C.P. Lond., of a daughter.

PENNEFATHER.—On March 16th, at Deanhurst, Harrow, the wife of Claud Maxwell Pennefather, M.B., of a son.

RICKETT.—On March 18th, at Sherborne, Dorset, the wife of Gerald R. Rickett, M.A., M.B. Cantab., of a son.

MARRIAGE.

BLOOD—AMOS.—On March 7th, at All Saints' Church, Cairo, Percival George Elgood, Major, late Devonshire Regiment, to Bonte Sheldon Amos, M.B.

DEATHS.

MCCONAGHEY.—On March 19th, at "Moorlands," Cyprus-road, Exmouth, in his 58th year, Colonel John McConaghey, late of I.M.S. Indian papers please copy.

PEARSE.—On March 7th, at Alfred-place, Plymouth, William Henry Pearse, M.D. Edin., aged 77 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HOSPITAL ABUSE: AN ATTEMPTED REMEDY.

ON March 12th the Newcastle-on-Tyne Central Dispensary for Diseases of the Nose, Throat, Eye, and Ear was opened. Diseases of the eye are treated on Tuesdays and Fridays at 9 A.M. and diseases of the nose, throat, and ear on Wednesdays and Thursdays at the same hour.

Patients are only seen subject to the following regulations:—

Special Regulations of the Central Dispensary.

I. That no patient except urgent cases, such as accidents, be treated unless they bear a letter of recommendation.

II. That urgent cases, such as accidents, will be seen on behalf of their ordinary medical attendant, who will therefore be entitled to charge his usual fee, and will not receive any after treatment unless they bear a letter of recommendation.

III. That no letters of recommendation be accepted, except those from medical men, or the Charity Organisation Society.

These regulations are admirable and should go some way towards solving the question of hospital abuse. As regards No. II., however, we doubt whether if a patient refused to pay his ordinary medical man a fee for the treatment received at the dispensary the medical man could recover such fee by law. Of course, the after-treatment must be paid for if carried out by the medical man. Regulation No. III. is also much to be commended, for the average possessor of a hospital letter uses it in the most haphazard style, and is accustomed to get very angry if his or her nominee is refused as an unfit case. We congratulate the authorities of the dispensary upon their departure.

GAS POISONING.

To the Editors of THE LANCET.

SIRS,—Some time ago I read an article in THE LANCET condemning the sliding chandelier, which if neglected and not regularly supplied with water allows the gas to escape, resulting in gas poisoning and in many cases explosions. Until recently I was not aware of the general ignorance of servants in this matter. I have within the past few weeks questioned no less than six different servants of long experience in Dublin houses and they all, without exception, said that they never heard of the thing being necessary or done in houses where they were employed. Now, it is a remarkable fact how popular these sliding chandeliers are in Dublin houses, both with the rich and the poor, and if the chandeliers are not properly looked after it is lamentable to think what sickness must be caused by gas escaping. I hope you will give prominence to this letter in the hope of enlightening the public against the use of sliding chandeliers and the dangers of gas poisoning.

I am, Sirs, yours faithfully,

Dublin, March 11th, 1907. P. B. P.

A CIRCUMSTANTIAL STORY.

UNDER the heading, "A Lady's Remarkable Experience," a newspaper published recently the following paragraph:—

> "An extraordinary event occurred at Boston on Saturday week. A Miss Annie Wold, who resides with her mother, complained of a peculiar feeling in her chest. Shortly after partaking of a dinner consisting of boiled beef, carrots, and potatoes she lay down to rest, when she was seized with a choking sensation, and to her horror vomited a creature several inches in length of a dark yellow colour and with two bright eyes, and the hind part curled over the back in the form of a tail. The lizard—for such it was—has been preserved in spirit, and will be forwarded to the College of Surgeons. Several persons have seen it and Dr. Wrinch describes it as being about six inches or seven inches in length."

Note the circumstantiality of the story. The fearful beast is described with a minuteness that only a personal inspection could warrant, and the medical man is, apparently at any rate, quoted as acquiescing in the accuracy of the narrative. Dr. Wrinch has written to us as follows:—

> "A patient of mine having previously complained of some slight throat trouble one day vomited up a thin membrane. She got it into her head that 'it was alive,' and her neighbours were called in to see the 'thing,' when it was made out to be an animal of some description. The patient called me in three days after to look at it, and I at first thought it was a bronchial cast—anyhow I assured her that it was not alive. I said that I would have it examined microscopically. This was done, and the substance was reported by the Clinical Research Association to be a 'vegetable leaf in a partial state of digestion.' In the meantime the wonderful occurrence had been so talked about, I suppose, that it reached the ears of some reporter, for two or three days after the episode there appeared in a newspaper a paragraph in which I was quoted as saying that the animal was so many inches long."

We have come to the conclusion that there is nothing that the lay journal will not believe if only the occurrence lies outside the normal range of medicine. Within that range many newspapers will cheerfully contradict the commonplaces of science.

A CURIOUS MEDICAL ACCOUNT.

WE have received from a medical correspondent an interesting little document in the shape of a bill for medical attendance on a well-to-do farmer and his family during a period of about ten years—namely, from 1842 to 1852. During this time, we understand, there were five births and three deaths in the family and several long attendances besides. The bill reads as follows: "Slaidburn, May, 1853. Mrs. Waterworth. To Visits, Medicine, and Attendance from 18th October, 1842, to 9th October, 1852, £6 8s. 6d.; by goods, £3 0s. 6d.; total due to Mr. Theodore D. Jackson, £3 8s. 0d." The bill bears at the bottom the intimation that particulars will be supplied if required and it was paid on May 29th, that is two days after it was received by the debtor. A curious feature of the bill is the item "By goods," which reminds us of the system of barter in existence at this comparatively recent period of time. Part of the payment was in kind and would probably consist of hay and other farm produce. No doubt the country medical man often receives payment in this way, but 50 years ago this primitive method of exchange was very usual.

FOR SEA-BIRDS.

To the Editors of THE LANCET.

SIRS,—The inclosed cutting from to-day's *Mirror* must surely touch bed-rock in the hunt for sea-birds:—

VARICOSE VEINS

are due to sluggish blood and weakened nerve force. When healthy, your blood and nerves are highly magnetic. When these great life centres lack magnetism you must be a prey to disease. Magnetic Leggings restore the missing force and thus cure you. Price: One Pair of Leggings £1 1s. or 7s. 6d. deposit and seven instalments of 2s. 6d. Send measurement round calf and above ankle. Write for our valuable FREE BOOK on Magnetism, it shows how you can cure all diseases in your own home. THE INSTITUTE OF NATURAL THERAPEUTICS (Dept. D.M.), 73, Queen Victoria-street, E.C.

N.B.—Elastic Stockings wear out quickly and have never cured anyone.

The advertisement should appeal to all who have faith in mechanical wonders like the "Evans Vacuum Hair Raiser."

I am, Sirs, yours faithfully,

DONALD J. MUNRO, B.S., M.B. Lond., &c.

Acre-lane, Brixton, S.W., March 14th, 1907.

A POST-CARD.

WE have received the following unsigned post-card. When such evidences of credulity are forthcoming we can hardly wonder that the specious promises of quacks are widely believed:—

2/3 07.

SIR,—Seeing in to-day's paper that you have published a list of those who have killed themselves I would like to let you know I In Daily Malta Chronicle (address Daily Malta Chronicle Malta and 1d. stamp will find it) about October 1902 appeared an account of a successful experiment—or some stuff applied—which brought a strangled dog to life after being dead 8 hours and which the discoverer thinks would be equally efficacious if applied to human beings. II In Daily Express (a London ½d. daily) on 4th October 1902, and in Lloyd's Budget and People same week appeared an account of a successful experiment which brought cats, dogs, bees, flies, and 1 drowned boy (given up for dead by doctors) to life after hearts ceased beating. The subjects were asphyxiated and brought to life by being placed on a warm plate or cloth and entirely covered with the following powder after which life appeared:

Extract from Article.

"The doctor makes use in his experiment of a light salt solution saturated with oil of the body which is allowed to stand exposed in an atmosphere of free ammonia. From this solution a powder is derived and it is this powder which contains the life renewing properties."

Now Sir kindly tell *immediately local authorities where fatalities took place information* I re those who hanged themselves and II re those who were drowned or asphyxiated—in any cases which occurred during last *7 days—have above experiments* tried immediately on bodies, *saving perhaps valuable lives.*

Yours &c.

THE "THERMASEP" CLINICAL CASE.

THIS is a metal case designed to keep the clinical thermometer in an aseptic condition. At one end of the case is a small chamber containing paraform. It is just above this space where the bulb of the thermometer rests. Paraform gives off formic aldehyde vapour. The "Thermasep" is supplied by Mr. W. Martindale of 10, New Cavendish-street, London, W.

WHAT IS PLASTICINE?

To the Editors of THE LANCET.

SIRS,—Can any of your correspondents tell me what "Plasticine," a modelling material, is made and coloured with? It has, I have found, caused a disease of the nails in a little girl who has been using it.

I am, Sirs, yours faithfully,

March 13th, 1907. LONDON.

WANTED—A HOME.

A CORRESPONDENT, who is a senior student of medicine, but who for some eight years has been suffering from Graves's disease and whose sole worldly possession is a sum received from a benefit society of 6s. a week, is anxious to know whether there is any hospital or any home which will admit him free for two or three years. Professor Clifford Allbutt is acquainted with the case and considered in November, 1905, that our correspondent might recover if he were put under suitable conditions for acquiring rest in the open air. Perhaps some of our readers know of an institution such as is required.

FOODS FOR THE DIABETIC: A CORRECTION.

To the Editors of THE LANCET.

SIRS,—In your last issue appeared a paragraph mentioning Casoid and Casoid Meal diabetic breads in connexion with the name of another firm. As we are the only makers in the world of these two special diabetic breads, we shall be glad if you will be good enough to publish this correction. Thanking you in anticipation,

We are, yours obediently,

74, Regent-street, London, W., March 19th, 1907. CALLARD & Co.

THE "ANTISEPHONE."

THE "antisephone" consists of a wax tube made in the shape of, but a little smaller than, the telephone receiver into which it fits and two small steel springs serve to keep it in position. The wax is impregnated with a volatile antiseptic oil so that it is assumed that this mouthpiece prevents infection. The use of a volatile antiseptic is, of course, cleanly and may have some germicidal effect, but the evidence of bacteriological experiment seems to us to be required before it can be positively stated that the use of the "antisephone" renders the telephone mouthpiece absolutely free from infective matters. The patentees and manufacturers are the Patent "Antisephone" Co., Chapel Walks, South Castle-street, Liverpool.

THE HISTORY OF MEDICINE.

To the Editors of THE LANCET.

SIRS,—The following is possibly more important than any of those works mentioned in your reply to "W. H. R.": "Handbuch der Geschichte der Medizin," begründet von Th. Puschmann, herausgegeben von M. Neuburger und J. Pagel, 1902-05. Fischer, Jena. It is published in three large octavo volumes.

I am, Sirs, yours faithfully,

CUTHBERT E. A. CLAYTON,

March 15th, 1907. Librarian, Manchester Medical Society.

Mr. B. B. Gough.—So far as we are aware, the only ground upon which a servant could claim against her employer in the circumstances suggested would be that of negligence. If he knowingly and recklessly exposed her to the danger of infection without her being aware that it existed, we should say that he might be held liable. Whether she would be likely to win her case would depend upon the evidence which she could bring to prove that her employer was negligent and that his negligence caused her condition.

M.R.C.S., L.R.C.P.—The preparation in question may give relief in some cases, but it should never be used by anyone except under strict medical supervision, for it contains cocaine and atropine. The preparation is sold under the usual conditions of pretence and extortion prevalent in American quackery.

Mr. R. E. Norris.—Yes, the person in question is a quack. We advise our correspondent to have nothing to do with him or his "remedies."

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Stewart's Instruments.)

THE LANCET Office, March 21st, 1907.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. in shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Mar. 15	29·980	S.W.	0·04	72	55	39	46	47	Cloudy
,, 16	29·800	S.W.	0·10	56	52	47	47	49	Cloudy
,, 17	29·810	S.W.	0·04	96	54	42	42	45	Cloudy
,, 18	29·604	W.	0·03	95	58	45	49	54	Cloudy
,, 19	29·980	W.	...	95	53	40	40	43	Fine
,, 20	30·078	WNW	0·04	102	55	43	45	49	Cloudy
,, 21	30·506	S.W.	...	80	54	37	38	41	Fine

During the week marked copies of the following newspapers have been received:—*The Mirror (Trinidad), Manchester Guardian, Chester Observer, Surrey Advertiser, Shetland News, Leytonstone Express and Independent, Daily Chronicle, Edinburgh Dispatch, Hull Eastern Morning News, Daily Express, Standard, Daily Mail, Glasgow Herald, Montgomery County Times, Bristol Observer, Liverpool Courier, Yorkshire Post, Scotsman, Manchester Dispatch, Weekly Times and Echo, Chiswick Times, Sheffield Evening Telegraph, Westminster Gazette, Wimbledon Borough News, Literary Digest (New York), &c.*

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (25th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (3 P.M.), St. Mark's (2.30 P.M.).

TUESDAY (26th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (2 P.M., Ophthalmic, 2.15 P.M.), Tottenham (2.30 P.M.).

WEDNESDAY (27th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.).

THURSDAY (28th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (2.30 P.M.), Tottenham (Gynæcological, 2.30 P.M.).

FRIDAY (29th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.).

SATURDAY (30th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

MONDAY (25th).—MEDICAL SOCIETY OF LONDON (11, Chandos-street, Cavendish-square, W.).—8.30 P.M.: Papers:—Mr. L. Jones: The Operative Treatment of Ascites.—Dr. W. I. Bruce: Relation between Sciatica and Hip-joint Disease.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN (20, Hanover-square, W.).—7 P.M.: Council Meeting. 8 P.M.: Dr. C. Stewart will exhibit and describe some Dental Specimens from the Hunterian Museum. Casual Communication:—Dr. J. W. Pare: A New Local Anæsthetic. Paper:—Mr. J. G. Turner: Hereditary Hypoplasia of Enamel.

TUESDAY (26th).—ROYAL MEDICAL AND CHIRURGICAL SOCIETY (20, Hanover-square, W.).—8.30 P.M.: Paper:—Mr. J. Hutchinson, jun.: (1) Case of Recovery after Operation for simultaneous (a) Acute Obstruction by Band formed of Vermiform Appendix and Omentum, with (b) General Septic Peritonitis; (2) Series of Drawings and Radiographs to Illustrate Certain Dislocations and Fractures of the Thumb and Great Toe; (3) on Volvulus of the Entire Small Intestine, Cæcum, and Ascending Colon; Operation and Recovery; with an Analysis of Nine other Cases of Complete Volvulus. (With microscopic and epidiascope demonstration.)

THERAPEUTICAL SOCIETY (Apothecaries' Hall, Blackfriars, E.C.).—4.30 P.M.: Papers:—Dr. W. E. Dixon: How Drugs produce their Effects.—Dr. N. Tirard: Opium in the Treatment of Pneumonia.

WEDNESDAY (27th).—HUNTERIAN SOCIETY (Poplar Hospital, Blackwall, E.).—4 P.M.: Clinical Meeting. Cases can be seen at 3.30 P.M.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (25th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith road, W.).—2 P.M.: Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eye. 2.30 P.M.: Operations.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Mr. W. Evans: Clinique. (Skin.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Tottenham Hospital, N.).—Cliniques:—9.30 A.M.: Surgical Out-patient (Mr. H. Evans). 2.30 P.M.: Medical Out-patient (Dr. Whipham), Throat, Nose, and Ear (Mr. Carson); X Ray (Dr. Pirie).

LONDON SCHOOL OF CLINICAL MEDICINE (Dreadnought Hospital, Greenwich).—2.30 P.M.: Operations. 2.30 P.M.: Sir D. Duckworth: Medicine. 3.15 P.M.: Mr. W. Turner: Surgery. 4 P.M.: Dr. StClair Thomson: Diseases of the Throat, Nose, and Ear. Out-patient Demonstrations:—10 A.M.: Surgical and Medical. 12 noon: Ear and Throat.

TUESDAY (26th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Dr. Moullin: Gynæcological Operations. 2 P.M.: Medical and Surgical Clinics. Dr. Ball: Diseases of the Throat, Nose, and Ear. X Rays. 2.30 P.M.: Operations. Dr. Abraham: Diseases of the Skin.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Dr. L. Guthrie: Clinique. (Medical.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Tottenham Hospital, N.).—Cliniques:—10 30 A.M.: Medical Out-patient (Dr. Auld). 2.30 P.M.: Infectious Fevers (Dr. F. Thomson at the North-Eastern Fever Hospital, St. Ann's-road, N.). Gynæcological Out-patient (Dr. Giles). Surgical Out-patient (Mr. Edmunds). Surgical Operations (Mr. Carson).

LONDON SCHOOL OF CLINICAL MEDICINE (Dreadnought Hospital, Greenwich).—2.30 P.M.: Operations. 2.30 P.M.: Dr. R. T. Hewlett: Medicine. 3.15 P.M.: Mr. Carless: Surgery. 4 P.M.: Mr. M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M.: Surgical and Medical. 12 noon: Skin.

WEDNESDAY (27th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Dr. Ball: Diseases of the Throat, Nose, and Ear. Dr. Saunders: Diseases of Children. 2 P.M.: Medical and Surgical Clinics. X Rays. 2.30 P.M.: Operations.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Mr. J. Cantlie: Clinique. (Surgical.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Tottenham Hospital, N.).—Cliniques:—2.30 P.M.: Skin (Dr. Meachen), Eye (Mr. Brooks), Medical Out-patient (Dr. Whipham).

LONDON SCHOOL OF CLINICAL MEDICINE (Dreadnought Hospital, Greenwich).—2.30 P.M.: Operations. 2.30 P.M.: Dr. F. Taylor: Medicine. 3.30 P.M.: Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M.: Surgical and Medical. 11 A.M.: Eye.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST (Brompton).—4 P.M.: Lecture:—Dr. R. A. Young: Pulmonary Tuberculosis in Childhood and Infancy.

CENTRAL LONDON THROAT AND EAR HOSPITAL (Gray's Inn-road, W.C.).—5 P.M.: Demonstration:—Dr. A. Wylie: Pharynx.

THURSDAY (28th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eye. 2.30 P.M.: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Tottenham Hospital, N.).—2.30 P.M.: Gynæcological Operations (Dr. Giles). Cliniques:—Medical Out-patient (Dr. Whiting), Surgical Out-patient (Mr. Carson). 3 P.M.: Medical In-patient (Dr. Chappel).

LONDON SCHOOL OF CLINICAL MEDICINE (Dreadnought Hospital, Greenwich).—2.30 P.M.: Operations. 2.30 P.M.: Dr. G. Rankin: Medicine. 3.15 P.M.: Sir W. Bennett: Surgery. 4 P.M.: Dr. H. Cooper: Radiography. Out-patient Demonstrations:—10 A.M.: Surgical and Medical. 12 noon: Ear and Throat.

FRIDAY (29th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Dr. Moullin: Gynæcological Operations. 2 P.M.: Medical and Surgical Clinics. Dr. Ball: Diseases of the Throat, Nose, and Ear. X Rays. 2.30 P.M.: Operations. Dr. Abraham: Diseases of the Skin.

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Tottenham Hospital, N.).—9.30 A.M.: Clinique:—Surgical Out-patient (Mr. H. Evans). 2.30 P.M.: Surgical Operations (Mr. Edmunds). Cliniques:—Medical Out-patient (Dr. Auld), Eye (Mr. Brooks). 3 P.M.: Medical In-patient (Dr. Leslie).

LONDON SCHOOL OF CLINICAL MEDICINE (Dreadnought Hospital-Greenwich).—2.30 P.M.: Operations. 2.30 P.M.: Dr. R. Bradford: Medicine. 3.15 P.M.: Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M.: Surgical and Medical. 12 noon: Skin.

SATURDAY (30th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Dr. Ball: Diseases of the Throat, Nose, and Ear. 2 P.M.: Medical and Surgical Clinics. X Rays. 2.30 P.M.: Operations.

LONDON SCHOOL OF CLINICAL MEDICINE (Dreadnought Hospital, Greenwich.).—2.30 P.M.: Operations. Out-patient Demonstrations:—10 A.M.: Surgical and Medical. 11 A.M.: Eye.

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MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1906, which was completed with the issue of Dec. 29th, were given in THE LANCET of Jan. 5th, 1907.

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